THE IRON AGE

New York, August 21, 1924

ESTABLISHED 1855 VOL. 114, No. 8

Rapid Progress in Shortening Hours

Twelve-Hour Day and Seven-Day Week Have Disappeared to a Very Large Extent in Year Since Change Was Inaugurated

BY GEORGE SMART

ONE year ago last Thursday, a start was made in abolishing the 12-hr. day and introducing shorter hours in the iron and steel industry. This departure, which was universally regarded as one of the most important ever made by iron and steel manufacturers, came after long agitation and followed the meeting at the White House in 1922 called by President Harding, after which thorough consideration was given the problem by iron and steel manufacturers. It was decided to conform to the President's wishes and what seemed to be strong public sentiment in spite of the fact that some company officials had serious doubts as to the results, and as to whether the majority of employees really wanted the change. President Coolidge, in his speech of acceptance last Thursday night, stated that the 12-hr. day and the 7-day week had been virtually abolished. This has been the general belief. Some companies, however, naturally moved more rapidly than others in inaugurating the change and it has been charged in one quarter that much remains to be done in introducing the shorter day and that the 7-day week, virtually abolished by the greater part of the industry years ago, has been reestablished.

"The Iron Age" Investigation

THE IRON AGE has made an investigation at the leading steel manufacturing centers to determine the facts as to what has actually been accomplished in shortening the hours of labor. The result is that much new light has been thrown on the whole situation. As to the benefits in social conditions, even the critics who complain because all the companies have not fully introduced the shorter hours admit that much better feeling has been created among the men. Their homes are happier and there is little complaint because of reduced pay. It cannot be denied, however, that owing to the slackened demand for steel, with the corresponding decrease in operations at furnaces and mills, the subject uppermost in the minds of the employees now is as to how they can get more work and the greatest difficulty encountered by some of the employers is in having the men work six days a week and less than 12 hours a day. In the Pittsburgh district, among some of the independents, there is a disposition to allow the men to work longer when they are anxious to do so.

The independent steel companies may be divided into four classes. First, those that tried the 8-hr. system in past years and abandoned it. These are few, but the Lukens Steel Co. is a conspicuous example. Second, the companies of which the Colorado Fuel & Iron Co. is a type, which have long had the shorter hours and have not changed the system. Third, those companies which to a large extent have conformed to the shorter hours, and lastly the few who have done little or nothing in the way of changing their systems. Probably the last-named companies do not turn out 10 per cent of the product of the country.

The Increased Cost

On the much-discussed subject of cost, it may be stated that Comptroller Filbert, of the United States Steel Corporation, has made a very careful analysis of the extra cost due to the change. He says: "During November and December, 1923, it was costing us extra for that period at the rate of $29,545,000 per year. If we were running fully the estimated cost of the change would be $35,000,000 per year."

In response to requests from THE IRON AGE for information as to what had been done by the Steel Corporation in establishing the shorter hours, Chairman Gary stated that he wanted to have the public given the fullest possible information and he thought that the presidents of the subsidiary companies would be best equipped to furnish the facts. He invited THE IRON AGE to send a representative to a meeting of the presidents and to ask questions in regard to the change of hours. This invitation was accepted and a stenographic report of the meeting was made.

Statements of Presidents

The presidents in attendance were: Homer D. Williams, Carnegie Steel Co., Pittsburgh; E. J. Buffington, Illinois Steel Co., Chicago; August Ziesing, American Bridge Co., New York; W. B. Schiller, National Tube Co., Pittsburgh; E. W. Pargny, American Sheet & Tin Plate Co., Pittsburgh; George G. Crawford, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; William P. Palmer, American Steel & Wire Co., Cleveland.

Judge Gary presided at the meeting and James A. Farrell, president of the United States Steel

Corporation, also was present. The stenographic report is as follows:

Action of the Carnegie Steel Co.

MR. WILLIAMS: On Aug. 16, 1923, we started in as fast as we could to put the blast furnaces on the 8-hr. basis. After we got men, we started every department and ran slack in some departments at times to put the 8-hr. day in. It took us about two months and we increased our forces about 9000 men and we have no 12-hr. men working in any of our departments. The seven-day week was abolished years ago, of course. It was brought in partially during the war and then was eliminated again. We have no 12-hr. men in any of our plants and we do not work the seven-day week. That covers Youngstown as well as all others. There may have been emergencies arisen due to accident, etc., where a man has worked 16 hr. or maybe 24 hr. to keep the plants running. There may be a case of a man who does not show up, where the man on the job has to work 16 hr. However, this would be an isolated case, and with the man's consent to work. Such a case happened within the past year. A statement is made that the Carnegie Steel Co. has not abolished the 12-hr. day in Youngstown. I deny that.

Change Completed by Illinois Steel Co.

MR. BUFFINGTON: Our case is substantially like Mr. Williams'. What I say is true of all the plants of the Illinois Steel Co.—Gary, South Chicago and others. The Illinois Steel Co. commenced the abolishment of the 12-hr. turn in August, 1923, and about in the same way as described by Mr. Williams I have not in mind the exact number of additional men we have employed to take care of the change. It took us several months to complete the program. I think it ran into 1924 before we had entirely made the changes in all departments. As Mr. Williams says, the abolishment of the seven-day week occurred several years ago. That we are observing. The Illinois Steel Co. has not a 12-hr. job at any of its plants. Our shops have been on a 10-hr. basis in the non-continuous departments. There will arise emergencies where some few men will work over the 10 hr., maybe up to 12, in a breakdown up perhaps to 18 hr. But these are rare exceptions.

American Bridge Co.'s Action

MR. ZIESING: Our principal work is structural work. All structural shops were on 10-hr. basis and always have been on 10-hr. basis. Years ago we abolished the seven-day week. We have a mill at Pencoyd which was put on 8-hr. basis either the middle of September or first of October last year, and we have adhered strictly to that schedule. None of our men now work more than 10 hr. nor more than six days a week.

National Tube Co. Falls in Line

MR. SCHILLER: We have no 12-hr. jobs in any department in any of our works. We began to change from the 12-hr. to the shorter day on Aug. 16, 1923, and that work was not entirely completed until some time in 1924. We changed even our watchmen and our nurses. We changed as fast as we could secure workmen. The seven-day week was abolished about 1911 or 1912, and as I was the sponsor for the elimination of the seven-day week, I was perhaps more insistent upon that than some others. With very few exceptions it continued throughout the war. The six-day week was immediately restored upon declaration of peace. There has been no seven-day week in our mills since a short time after the armistice. We have retained as many 10-hr. jobs as was possible, but have none for a longer period. The majority of our jobs have always been 10-hr. positions. Our attitude with respect to the seven-day week is that no man shall be required nor permitted to work more than six days a week. I have no doubt that from time to time there are instances where a man may work longer than 8 hr., or even 10, either due to failure of another man to report for duty, or to an accident, but this occurs only in an emergency. So that in principle and in fact the 12-hr. day is eliminated in the National Tube Co.

American Steel & Tin Plate Co.

MR. PARGNY: Our rolling mills have been on a three-shift basis as long as I can remember. We were less involved in the elimination of the 12-hr. day in other departments than any of the other constituent companies. At the time the subject was discussed, I think we had about 15 per cent of our men working the 12-hr. day, and in little less than 60 days from Aug. 16, 1923, we had not a man working 12 hr. We have not one working for us 12 hr. today, nor do we work the seven-day week. It was a simple matter for us to abolish the 12-hr. day by reason of the small percentage of men involved.

Conditions in the South

MR. CRAWFORD: For many years, even during the war, our steel making department, rolling mills and shops were shut down every Sunday. In the continuous working departments, relief is supplied so that each man works only six days a week. On the 12-hr. day, that has been abolished—a little bit later than the other companies because I was away on my vacation and our company was not ordered to put it down until I returned. But I think in February, 1924, we had abolished the 12-hr. day. Our men work 10, 9 and 8 hr. Occasionally a man has to stay on over his regular working period in case of accident, etc. In each case where a man has to work over six days a week or over 10 hr. a day, the matter is taken up at our weekly meeting of heads of departments and a good reason must be given for it.

MR. FARRELL: The Tennessee Coal, Iron & Railroad Co. is the only company in the South that has abolished the seven-day week and 12-hr. day. Also we pay 15 to 25 per cent more wages than the other iron and steel manufacturers in that district.

Mr. Palmer Tells Why Men Worry

MR. PALMER: We have not any job that is a seven-day week job, nor have we any 12-hr. day jobs. While this question may bother others, it does not bother our workmen. What is bothering them is that they can get only three or four days' work a week. That point should be emphasized.

MR. SMART: What is the increase in the percentage of men, Mr. Williams?

MR. WILLIAMS: Nineteen per cent.

MR. BUFFINGTON: The plan that we outlined for making the change showed that we would require 20-odd per cent additional men, and we wound up with 19 and a fraction per cent.

MR. SCHILLER: That does not apply to the National Tube Co. because the majority of our work-

men are in the pipe mills, where the 10-hr. day is in operation.

MR. SMART: The increase in the continuous process is about what percentage?

MR. WILLIAMS: All continuous processes are increased about 50 per cent.

Cost to the Steel Corporation

MR. SMART: There is a statement that the United States Steel Corporation anticipated the increase in cost to the corporation of the institution of the three-shift system would be $35,000,000 yearly. I suppose that varies from year to year in accordance with operations.

MR. FARRELL: Absolutely. If we are working on a 50 per cent basis, the amount is smaller.

MR. SMART: Where has the greatest change taken place? What has your observation been relating to the improvement of social conditions by the change? Is there a better feeling among the men?

MR. WILLIAMS: Very much. We are having requests for a garage for nearly every house now.

Changes as to Wages and Production

JUDGE GARY: Will one of you tell me briefly just what we did in regard to increasing wages in order to meet the decrease in the number of hours? For instance, the 12-hr. men who were reduced to 8 hr.?

MR. BUFFINGTON: Twenty-five per cent. The 12-hr. men were reduced to 8 hr. and paid for 10 hr.

MR. SMART: What was the general effect on production?

MR. WILLIAMS: In the blast furnace it depends on the amount of air you blow in.

JUDGE GARY: That is, three shifts do not produce more than two shifts?

MR. WILLIAMS: No. In some of the up-to-date, modern mills it depends on the motor revolutions. There is practically no increase in output.

MR. CRAWFORD: We have a lot of old mills where hand work is required. When the men are tired and the mills slow up, we have spell hands to relieve them, so that the production is maintained even though the men are not working 8 hr. but are working 10 hr.

MR. SMART: In machine shops I suppose there is a change.

MR. CRAWFORD: We have never worked 12 hr. in machine shops.

President Harding's Letter

JUDGE GARY: Just to refresh your recollection I want to read President Harding's letter to me. He says, referring to the 12-hr. day: "In the hope that this question could be disposed of I am wondering if it would not be possible for the steel industry to consider giving an undertaking that before there shall be any reduction in the staff or employees of the industry through any recession of demand for steel products, or at any time when there is a surplus of labor available, that then the change should be made." He said above, preceding that: "I am impressed that in the reasoning of the report great weight should be attached to the fact that in the present shortage of labor it would cripple our entire prosperity if the change were abruptly made." Then I said to him in answer: "Without an unjustifiable interruption to operations, the change cannot be effected overnight. It will involve many adjustments, some of them complicated and difficult, but we think it can be brought about without undue delay when, as you state it, 'there is a surplus of labor available.'" That was distinctly understood.

MR. SMART: It is reported that the actual increase in cost has been placed at an average of $3 per ton—$4 on sheets and $2 on billets.

MR. WILLIAMS: I think that the records here would be the best to show that.

JUDGE GARY: Yes. I think I have kept the public pretty accurately informed from our records. If I make any misstatements about our figures, the Federal Trade Commission finds out pretty soon.

MR. SMART: It is reported that "the data presented by the Department of Labor, for the period Jan. 16 to 31, this year, would seem to indicate that on the blast furnaces less than 8 per cent of the men work 48 hr. or less a week; 6 per cent work 84 hr. a week; 32 per cent, 60 hr. or over, and 54 per cent more than 48 hr. or less than 60 hr."

MR. FARRELL: They may have gone to Birmingham to get those figures.

MR. CRAWFORD: A lot of men in the blast furnace department have never worked 12 hr., and those men have not been changed to 8 hr.

Working Toward the Goal in the Pittsburgh District

No Man Now Required to Work 12 Hours, but Many Insist Upon Doing So, Owing to Decrease in Number of Days of Employment

PITTSBURGH, Aug. 18.—When the steel industry a year ago began the elimination of the 12-hr. day, it was found that the setting up of three 8-hr. turns in the departments of continuous operation—blast furnaces, open-hearth furnaces, Bessemer converters and coke plants—grooved nicely with the change. Because of that condition, the impression was created and has increased since that the industry had definitely embarked upon a plan of establishing the 8-hr. day. While there is little question that such a working period was and is the ultimate goal of the movement and indeed elimination of the 12-hr. day had made some progress before the formal inauguration of the scheme on Aug. 16, 1923, it should be borne in mind that the elimination of the long workday and that alone was what the industry set out to accomplish. In the Steel Corporation and some other companies, the 7-day week had been eliminated.

Judged strictly on that premise, the endeavor has been marked with success, in that there are few, if any, men in the Pittsburgh district plants, except by their own expressed desires, who are working longer than 10 hr. daily. The fact that business has been slack and that today even in the face of increased orders the industry is not more than 50 per cent engaged, explains such lapses, which have been and still are more frequent in the independent company plants than those of the Steel Corporation.

Attitude of the Employees

From the beginning of the movement, the abolishment of the long working turn, so strongly opposed by the

reformers and welfare workers, though strangely enough not so offensive to the men themselves, has been a serious matter with the Steel Corporation officials and plant managers, who after painstaking and laborious efforts to evolve workable plans, resent suggestions contained in a report recently made by an investigator employed from a fund left by a wealthy Bostonian, that the men employed in the continuously operated departments still work a 7-day week and that "the three 8-hr. shifts, 6-day week schedule does not prevail in any Steel Corporation district visited."

The plan worked out and successfully put into operation at the plants of the Steel Corporation was very specific. It provides that no man employed in the blast furnace, open-hearth furnace, Bessemer converter or coke oven departments, who formerly worked 12-hr. turns, shall work more than six consecutive alternate turns without a day's layoff. This plan once announced and applied then became a rule and such violations as occurred were to be the subject of a detailed report, giving the reasons for the violation by the foreman to the plant superintendent. There are some instances at Steel Corporation plants where there was not a single violation of the rule during the entire first year of the shorter day movement, and in most cases where they have occurred it has been due to confusion or misunderstandings by the men as to the turns they were to work.

Some Hard Nuts to Crack

It was not a simple matter for the plant managers who were charged with the work of evolving a workable three 8-hr. shift, 6-day week schedule and it was not easy for men long accustomed to working 12-hr. turns to accommodate themselves quickly to the shorter workday. It was natural, therefore, that some confusion should result before the plan got working smoothly. Nine men in ten, if given a choice, would take Sunday as the day off, which of course would not be feasible. The number of men in a crew determined the schedules, and since crews varied as to numbers, no such thing as a standardized schedule could be worked out. Moreover, schedule juggling has been necessary through the inability or failure of one or more members of a crew working a given turn to come out. In a case where a man has given notice that he cannot report, it is the plan, particularly if the man to be absent has an important place in the operation, to select the man from the crew at work best suited to fill the vacancy. This has caused trouble, because the man taken out of his regular turn to fill in for another in another shift loses half a turn and usually has to lose another half turn to get back to his regular shift.

Definite Progress Made

There is not a company in the Pittsburgh and nearby districts which operates blast furnaces, steel works and rolling mills—in other words, a fully contained plant—which has not made very definite progress in the elimination of the 12-hr. day. With the Steel Corporation plants, the effort has long since been completed, and at not one of its plants are there today or for some time past any 12-hr. turns. There may be some night watchmen or yardmasters whose turn of duty runs 12 hours, but even such cases are few and even the policemen and welfare workers now are on 10-hr. turns. Taking in the independent companies which for one reason or another have made rather slow progress and those which have done practically as well as the Steel Corporation, it is a fair estimate that about 60 per cent of all the men who prior to Aug. 16, 1923, were on 12-hr. turns, now are on either 8 or 10-hr. turns. The blooming mill crews, who after the inauguration of the shorter workday also were placed upon three 8-hr. turns, in not a few plants, even some of the Steel Corporation plants, lately have been working two 10-hr. turns. But that is because the plants have not been running full for want of business. There is no question in the minds of steel company plant officials that if business had continued at the gait of the fore part of this year with its attendant high rate of plant operations, the establishment of the three 8-hr. turn day and 6-day week would have made much more progress than it has. But as is well known steel business slumped in March and has not been really good since.

To have been able to put across the 8-hr. day and 6-day week, two things would have been necessary. The first was an ample supply of labor and the other was a good run of orders. Economic wisdom is lacking where plants are operated more turns than are warranted by the orders. Actually, there has been a surplus of labor for the past few months and with business very slack, it has been something of a problem to give all a share of the available work. At the beginning of this year, THE IRON AGE in a canvass found that the long work day had been eliminated in the Pittsburgh district to the extent of 70 per cent of the men who had formerly worked that long. There is no reason now, one year after the inauguration of the movement, to modify that estimate, and as stated before, the dull times, rather than any other cause, stood in the way of further progress.

Effect on Production

As to results of the change in working hours, the notion that there was more production because the men did not have to work so long is not supported by the checkups made by several plant superintendents here. It has been found that rolling mill crews working on 10-hr. turns have turned out the same amount of tonnage as done on 12-hr. turns, but that calls for explanation. Most steel plants have an excess of rolling over steel-making capacity and by using the extra capacity and letting the repairs accumulate, the 10-hr. turn has worked as satisfactorily as the longer one. But when it comes to blast furnaces, open-hearth furnaces and Bessemer converters it is the size and the capacity of the unit and not the number of men nor the number of shifts per day that govern the production. The folly of claiming greater production on the ground of shorter work periods for the men must be apparent to those who give the matter a little study. Incidentally, it is a little difficult to figure much real change in the actual working hours of the men in continuously operated departments. An observer who made the test in an open-hearth plant when the working turn was 12-hr., found that the men in the crew were actually on their feet only 3 hour and 15 minutes. In the 8-hr. turn they are probably actively engaged fully as long.

Increase in Men Required

Increase in the number of men required in effecting the change from the two to the three-shift system is not measured by 10 or 12½ per cent. It is at least 20 per cent, although there are some cases where the change was made with no increase at all in the number of men required. In some instances, where the attempt was made to make three crews out of two, there was early grief, since accidents disclosed there were not enough men to keep the unit going and make repairs. It has been found the safer course, therefore, to have a larger crew than was absolutely necessary, to be prepared for emergencies.

The idea that the men would not return to the 12-hr. day is not well supported and there is no doubt in the minds of plant managers in daily contact with the men, that if the employers were willing, there was no public objection and the same hourly rate as is now paid was paid for 12 hours, 90 per cent of the men now working the short day would seek the longer day. It is useless to deny that the men never took kindly to the reduced

daily income and it is likewise idle to attempt to conceal the fact that in many instances the men have tried in recent dull times to work a second turn in a day in an effort to swell their incomes.

Twelve-Hour Day Gone at Youngstown—Some Work Seven Days

YOUNGSTOWN, Aug. 19.—Operating managers of district iron and steel properties declare that the 12-hr. day has been abolished by independent interests in the Mahoning Valley, with the exception of a few men employed in safety departments as watchmen. Such instances represent but a negligible number of the total workers employed. Very few, if any, men employed in production processes in the Mahoning Valley, are still on 12-hr. shifts. One independent employs a small number of mechanics and millwrights on 12-hr. turns when occasion arises.

Skilled and semi-skilled workers in sheet mills, which comprise a considerable percentage of the finishing capacity of the district, have long worked 8-hr. shifts.

The practice in the Valley for common labor, workers in shops attached to the mills, and for employees of the tube mills is to work 10 hr. per day, alternating one week six days and the following week five nights. Under this arrangement, affected workers are employed 58 hr. per week on day turn and 50 hr. on night turn.

Employees of blast furnaces and by-product coke oven plants work 8 hr. per day, seven days a week. The practice in manning open-hearth furnaces is much the same, except that such departments more frequently suspend one day over the week-end. Employees in these three departments are privileged to take one day off in seven; coke oven workers avail themselves of this opportunity more than blast furnace and steel department men.

Men in the Bessemer converting plants are rotated in the same manner, except that such departments usually suspend over Sunday. It is the practice of one large independent to stop its Bessemer plant at 3 p. m. each Saturday afternoon and resume on Sunday afternoon at 5 p. m.

The operating executive of one of the principal independents in the Mahoning Valley states: "We do not have a 12-hr. man on our payroll except a few watchmen." This refers to one of the largest employing interests in the Valley. The assertion, therefore, in the report submitted to the Cabot Fund that large numbers of men are employed 12 hr. by the leading iron and steel companies is erroneous.

Mill managers generally state that steel workers are not satisfied with the 8-hr. day, because it has reduced the compensation they receive. The majority of employees, it is contended, except where the work is arduous and requires considerable physical exertion, prefer the 10-hr. shift because of the larger compensation it affords.

One of the leading independents, whose pipe mills represent an important part of its aggregate finishing capacity, estimates that half of its men work on 10-hr. shifts and the rest on 8-hr. turns. The matter of decreased compensation arising from introduction of the shorter work-day has been the subject of discussion at meetings of workmen and officials, in the Representation Plan of a Valley interest.

There would be no complaint, say the managers, if the men were paid on the basis of 10 hr. for 8-hr. work, but this is declared to be impossible under present conditions. There is some discussion to the effect that workers may formulate wage demands along this line, but operators of properties are in no mood to discuss such a sweeping advance at this time.

The estimate of $3 per ton increase in the cost of producing finished steel, through introduction of the 8-hr. day on a larger scale and abolishment of the 12-hr. day, is not out of line with ideas of Valley producers on this subject. On more highly finished steel products, the estimate is declared to be too low, the advanced cost in some cases running up to $4 a ton and more.

One interest states that its payroll has been increased 10 per cent as a result of the shortening of the work day.

Producers here say there has been no appreciable effect on production and that 8-hr. men do not produce proportionately more in 8 hr. than they previously did when working 10 hr. To offset this loss in production, it has, of course, been necessary to add more men, which has helped increase the payrolls.

Almost Complete Change at Chicago

CHICAGO, Aug. 19.—Independent iron and steel plants in this district are operating largely on an 8-hr. 6-day week schedule and have entirely abolished the 12-hr. day. Steel corporation plants are also operated on about the same schedule and have entirely done away with the 7-day week work. One independent company operates entirely on a three-shift basis in the coke oven, blast furnace, open-hearth and rolling departments and runs its mills on a 6-day week schedule, with a small amount of 7-day week work irregularly at the ovens and blast and open-hearth furnaces. Other independent mills also adhere to the 8-hr. day at coke ovens, blast and open-hearth furnaces and the 6-day week, except at the open-hearth furnaces, where some work is done on a 7-day week schedule. In the latter class of plants there is a considerable amount of common labor work on the 10-hr. day basis. Where shifts were made to the 8-hr. day the increase per hour in wages has been 25 per cent.

The shorter day has advanced costs of production, as steel executives declared it would when the movement was instituted at the White House under the direction of President Harding. Officials, however, declare that these figures have not been analyzed sufficiently as yet to indicate clearly what the greater costs are. They expressed surprise at statements made in the report to the Cabot Fund, which they declared were entirely inaccurate in a number of important respects, especially as they applied to the number of hours and days per week steel workmen are engaged. They also would not discuss what effect, if any, the shorter day has had in the way of increasing efficiency and morale or social conditions of employees.

All but One Company at Cleveland Adopts Short Hours

CLEVELAND, Aug. 19.—The 8-hr. day has been established for continuous operations and the 12-hr. day has been entirely abolished in all steel plants and blast furnaces in the Cleveland territory except in the plant of the Otis Steel Co. Blast furnaces operated by Cleveland interests at Lake ports and other points have adopted the 8-hr. day for continuous operations. With the one exception noted, men formerly employed for 12 hr. in the steel plants and blast furnaces for certain work other than continuous operation are now on a 10-hr. day.

While the Otis Steel Co. has not generally put the 8-hr. day into effect, this company has made vari-

ous reductions in working time to 8 and 10 hr. so that a small proportion of its force is now employed more than 10 hr. This company has not adopted a three-shift plan for continuous operations in its blast furnaces and about 25 per cent of its furnace employees work 12 hr. per day. Steel plants and blast furnaces operating on the three-shift 8-hr. day plan include those of the American Steel & Wire Co., the McKinney Steel Co., the Upson plant of the Bourne-Fuller Co. and the Cleveland Steel Co. Warren, Canton and Massillon steel plants are also on the 8-hr. day.

In no case have the steel plants or blast furnaces increased the working week from six to seven days. Conditions in respect to seven-day employment in blast furnaces are exactly the same as before the shorter working day went into effect. Men employed on continuous work in blast furnaces are required to work only six days. Some independent furnaces have a regular seven-day schedule and the employee must arrange to have some one do his work when he wants to take a day off. As many as possible are let off on Sunday, but a sufficient force must be on hand to keep the furnaces in operation. The American Steel & Wire Co. requires every employee, whether on continuous work or not, to take one day off out of the seven. In some of the independent blast furnaces a large share of the men on continuous operations want to work the seven days because of the increased earnings and this tendency appears to have become somewhat more pronounced since the shorter working hours were adopted.

Highly Satisfactory Results in Southern Ohio and Kentucky

CINCINNATI, Aug. 15.—The 8-hr. day is practically universal in the iron and steel industry of southern Ohio and northern Kentucky. The three-shift day has been in effect at the plants of the American Rolling Mill Co., Middletown, Ohio, the Andrews Steel Co. and the Newport Rolling Mill Co., Newport, Ky., for a number of years, and the results have been highly satisfactory. The Ashland works of the American Rolling Mill Co., acquired two years ago, is also on the three-shift basis, and the blast furnace plant of the company at Columbus is also working on the short turn. Results in all cases have been satisfactory to both management and employees.

In August of last year, merchant furnaces in southern Ohio eliminated the long turn, and all are now working the short turn. The change was accomplished without adding greatly to the number of men employed, though it was necessary to add a number of men at furnaces to fill out the three shifts. A better division of the working forces cut down the number of men required for the long turn, and it was found also that the men could work more efficiently on the shorter schedule, thus doing away with a number of relief workers on each turn.

Discussing the Cabot report, officials of steel companies in the district maintaining open-hearth plants, where the process is continuous, report that the statement that the men work eight hours a day for seven days a week is erroneous, in so far as their plants are concerned. In the open-hearths very little Sunday work is performed, the heats generally being held until the regular night turn reports. When it is absolutely necessary to tap heats, this work is done by what is called a "floating crew," that is, a crew to relieve regular turns, so that each crew has one day off each week. In the rolling mills, the 8-hr. shift is universal, and no Sunday work is performed. The men formerly employed 12 hours a day are now employed eight, and it is only in isolated instances where a man works over eight hours per day. One company in this district, employing nearly 6000 men, reports that there are not over 10 men in its employ working over eight hours per day.

At both steel works and merchant furnaces, it has not been found practicable to keep a floating crew in order to give an entire turn one day off each week, but sufficient extra men are kept to enable the regular workers to take one day off in seven. Of course, where a worker elects to work the full seven days, he is privileged to do so, but officials of the company discourage this as much as possible. When the change from two to three shifts was made last year, wages were advanced, so that though the men work four hours per day less than they used to, they receive practically the same remuneration as for the longer day.

There is no information available as to costs of producing steel under the old and new system, as steel makers in this district have been working three shifts for a long time, and costs at the time of making the change would not be an accurate gage of present conditions. However, in the case of pig iron, cost of production has increased at some furnaces with the installation of the three shift plan, though figures are not available from all furnaces. The increase is estimated from $1 to $2 per ton, depending on the output of the furnace, though some reports are at hand where the cost has not increased, the reason given for this being that a better division of the working force, combined with increased efficiency on the part of the men, has enabled the furnaces to increase outputs, thereby cutting down the cost of making iron.

There is no question as to the beneficial results of the three-shift plan of operations. It has been found that employees work steadier, are more efficient and generally are happier under the new order. They have additional time for recreation and rest, and are better satisfied generally than was the case when the long turn was the vogue.

Report to Cabot Fund Claims Much Remains to Be Done

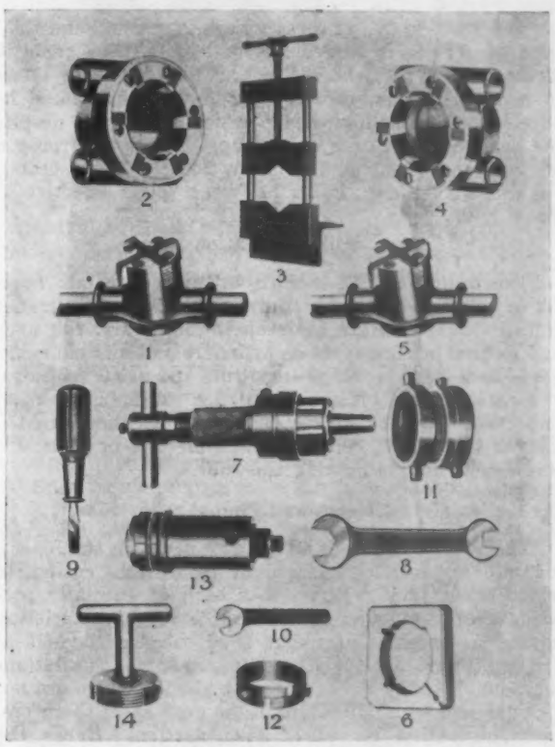
Philip Cabot, one of the trustees of the Cabot Fund, the other trustees being Paul U. Kellogg and Edward T. Duvine, has made public a summary of a report of an investigation made by Miss S. Adele Shaw, formerly a member of the editorial staff of the New York *Evening Post* and a frequent contributor to the *Survey* and other magazines. The summary of the report is as follows:

"Following a report on the Technical Results of the Three-Shift System as in Force in American Steel Plants in 1920, prepared for the Cabot Fund of Boston by Horace B. Drury under the direction of Morris L. Cooke, consulting engineer of Philadelphia, a report by the same author on the Technique of Changing from the Two- to the Three-Shift System in the Steel Industry issued by the Cabot Fund in 1922, and the Report of the Committee on Work Periods in Continuous Industry of the Federated American Engineering Societies, issued in 1922 as a result of investigations carried out under grant from the Cabot Fund, the trustees of the fund early this year decided to make a rapid check-up of the extent and results of the change to three shifts put into effect in the industry beginning Aug. 16, 1923, following the orders issued by Judge Elbert H. Gary, chairman of the board of

(*Continued on page* 481)

Tools for Standardizing Fire Hose Fittings

An assortment of tools for converting and maintaining non-standard hose coupling threads to the American (national) standard which recently was approved by the American Engineering Standards Committee and sponsored by American Society of Mechanical Engineers and other organizations has been placed on the market by the Wells Corporation, Greenfield, Mass. Two sets are available, the No. 1 for standardizing fittings from 2½ in. to 3⅞ in. outside diameter, and the No. 2 for keeping fittings in proper condition and for inspecting new fittings. A feature emphasized by the makers is the method of supporting the die while



Fire Hose Coupling Standardization Tools. Two complete sets are available, one for resizing the fittings and the other for maintaining them and for inspecting new fittings

threading the male fitting. Heretofore it has been difficult to start the die true on the end of an oversize thread but with the die guide shown at *13* in the accompanying illustration the danger of producing a thread out of line with the coupling is said to be eliminated. The cutters or lands used in the taps and dies may be changed and sharpened conveniently.

The roughing tap shown at *1* is finished red and has a tapered thread about ¼ in. under standard size at the end to permit it to enter easily and catch the thread on undersize female fittings and hydrant caps. The roughing die shown at *2*, also finished red, is for use on male fittings having an outside diameter over 3⅛ up to 3⅞ in. It is used in connection with die guide *13* for removing the excess metal on oversize male fittings. Cutters are fitted in the back of this die for removing the part of a thread on the end of the fitting to produce the Higbee cut.

At *4* is shown the finishing die, which is painted black. It is used in connection with the die guide, and after the application of the roughing die. It is for finishing to size male fittings larger than 3⅛ in. outside diameter. On fittings less than 3⅛ in., the expander shown at *7* should first be used to expand the fitting slightly oversize, the finishing die then being used without first using the roughing die. The self feeding roller expander will enter a 2⅞ in. diameter hole and expand it to 2½ in. The flexible expanding ring gage shown at *12* is slipped over the top of the threads on male fittings when using expander *7* and shows when the fitting has been expanded to proper size for re-threading.

The finishing tap *5* is to be used after the roughing tap *1* on female couplings and hydrant caps which are undersize. It is painted black. This tool may be used without the roughing tap on 7- and 8-thread fittings which are nearly standard size. At *6* is shown a field inspection square ring gage for use in checking male fittings which have been resized, and also for inspecting new fittings. The field inspection plug gage shown at *14* is employed in checking the size of female fittings which have been re-threaded, being used also to inspect new fittings. "No go" plug and ring gages are available for the No. 2 set of tools.

The handles furnished with the taps and dies are solid bars of steel which will not bend or break. They can be easily slipped into place after the tool is started on the work and locked with a thumb screw. A ratchet die is said to be unnecessary for use on hydrants near obstructions, as the handle may be slid through the die and operated from one side. The vise is of steel and may be used either in a vertical or horizontal position. Two vises are provided. A hardwood box fitted with handles and padlocks is available.

Spot Welders for Production Work

A new spot welding machine designated as the type N and intended for continuous service in production work has been added to the line of the Taylor Welder Co., Warren, Ohio. Three sizes of the machine are available, the smallest being the N2 for welding 30 gage up to two pieces of ⅛ in. sheets, and the largest, the N3, for work from 30 gage up to and including two pieces of 3/16 in. material. The machines are available with overhangs from 6 to 30 in.

The upper horn, which is adjustable in and out as to length, permitting the use of what is known as goose-neck welding points with one of the regular points, is a feature. The upper and lower horn may also be revolved in either direction to permit of welding in corners and inaccessible places. The lower horn is adjustable up and down, also sidewise in either direction.

The N2 machines are equipped with 10 kw. transformers, the other sizes having 15 kw. and 20 kw. transformers, respectively. An eight-step self-contained regulator is provided for adjusting the current to take care of the lightest work up to the heaviest within the capacity of the machine. The switch is designed so that it cannot close until the electrodes have made contact properly with the work, and adjustment is not required for different thicknesses of work or because of wear of the electrodes. The switch is provided with a lever for changing the trip quickly from automatic to non-automatic. The automatic trip is used for welding work that is buckled, the non-trip position being for wire work and clean sheets where rapid operation is desired. Pressure on the welding electrodes is controlled by hand wheel.

In addition to the usual water circulation in the upper and lower electrodes, the machine is provided with a water-cooled transformer. The foot operated machine is equipped with a foot treadle which may be adjusted in or out or swiveled 30 deg. either side to suit the convenience of the operator. The travel of the upper electrode and foot treadle may be varied by means of a lever at the front of the machine.

Mechanical stokers sold in July as reported by the Department of Commerce numbered 115 of 37,759 hp., the reports covering 15 establishments. The rating is slightly higher than in June or May, but is not much more than half the 61,000 hp. average of 1923. The figure for July of last year was 52,518 hp.

Table published in THE IRON AGE, Aug. 7, last page, 335, showing furnaces in and out of production as of Aug. 4, listed the Adrian furnace, DuBois, Pa., as not in production. This is an error, as the furnace was, on Aug. 4, and still is making iron.

Lubrication in the Steel Industry

Special Attention Needed for Rolling Mills and All Their Subsidiary Apparatus—Gears and Pinions a Problem—Plate Mills Subject to Unusual Conditions

BY ALLEN F. BREWER*

INGOTS usually are handled to and from the soaking pits by means of specially constructed overhead traveling cranes equipped with a nipper grip capable of holding an ingot rigidly and without danger of dropping it. This grip is operated by toggle joints. As this entire part of the mechanism must be lowered into the intense heat of the pit, every time an ingot is to be inserted or removed, it involves one of the most serious heat conditions which the lubricating engineer is called upon to meet.

When the nipper takes hold of an ingot ready for rolling, the temperature of the latter is in the neighborhood of 2000 deg. Fahr. The toggle mechanisms are naturally subjected to perhaps even higher temperatures than this, though they do not have to remain in the pit for any extensive period. Their lubrication is, nevertheless, a most difficult problem. Oftentimes it is met by application of an excess of the cheapest lubricant available—black oil; in other cases, a lighter grade of more adhesive, heat-resisting gear compound is preferred, especially as the temperature involved keeps this product sufficiently liquid to lubricate and yet does not cause it to drip off prematurely.

Elsewhere at soaking pits lubrication is confined to necessary bearings, etc., with which the covers are fitted. As heat and operating conditions are akin to those in the open-hearth furnace, black oil and a heavy gear compound generally are used, with perhaps a graphite grease for the hydraulic plungers.

Ingot buggy lubrication is a similar proposition, though it involves the added item of wire rope lubrication. This can, however, be handled adequately by careful and frequent application of the usual gear lubricant at hand. While lubrication of these buggies often may seem to be but a trifling matter as compared with more important equipment, it should never be neglected, for a hot 5-ton ingot is certainly not conducive to the most favorable pressure and temperature conditions. As a result, the bearings and other wearing parts may suffer considerably.

Rolling Mills

From the viewpoint of lubrication, conditions in the rolling mill are different from those discussed heretofore. In fact, lubrication of blooming mill gears, roll necks and steam engine cylinders involves probably more difficulties than any other phase of industrial plant operation.

When the ingot has been delivered to the ingot buggy and carried to the approach table of the blooming mill, it is automatically transferred to the rolls of the table. The approach table carries the ingot to the roll table, the latter working in conjunction with the rolls of the blooming mill. This mill consists essentially of two or three heavy cast steel rolls, gear-connected to a reversible steam engine or electric motor. The power rating of the driving element must be high, in extreme cases 35,000 to 42,000 hp. being necessary.

The finishing mills in turn embody the necessary finishing stages wherein rails, plates, strips and structural shapes are produced. A typical arrangement comprises three stands of rolls, similar to the three-high blooming mill. In such a mill the billet is directed by guides through the proper passes in the first and third stands. It is then elevated automatically and dropped into other guides which direct it back through the second set of rolls.

The construction of these guides is unusual and their type of service is severe for, of course, they come in direct contact with the hot metal. To enable the latter to slide easily and rapidly over them, they should be painted with some lubricant which will stick despite the heat, and not gum or dry up. For this purpose a mineral gear compound of from 2000 to 5000 seconds Saybolt at 210 deg. Fahr. has been found effective in many mills.

Mill Lubrication

The rolling mill, therefore, involves a certain number of rolls, shears, saws, transfer tables, electric cranes and driving units. In their operation, gears, roll neck and journal bearings, steam cylinders and miscellaneous guide and shaft bearings constitute the usual frictional elements. In the blooming mill, for example, the most important parts requiring efficient lubrication are the pinions and gears, roll necks and electric or hydraulic screw-downs for adjusting the rolls.

Gears and Pinions

The pinions adjacent to the roll necks in the blooming mill are usually inclosed in an oil-tight casing, in which event they are run in a bath of specially prepared gear compound of high adhesive characteristics, having a viscosity of about 2000 seconds Saybolt at 210 deg. Fahr. On the other hand, in some installations these pinions may be covered with shields which are not oil tight and with no bottom to the gear case; therefore, bath lubrication is out of the question. Hence the lubricant must be able to stick tenaciously to the pinions over the periods which intervene between its applications and maintain a sufficiently protective film. A viscosity of about 5000 seconds Saybolt at 210 deg. Fahr., is, therefore, necessary so that the resultant lubricating film may be able to withstand the terrific pounding and hammering which occurs, especially when the mill is reversed.

Not only in the blooming mill, but on all other rolls except in the plate and sheet mills, it is found necessary to run water constantly over the rolls and roll necks, for the dual purpose of cooling and blowing off scale which may be formed as the ingots, bars or billets are broken down. Some mills, in addition, blow steam directly onto the ingot during its first pass through the rolls, to remove the scale more effectively. Such conditions, coupled with the extreme heat constantly encountered, place a most exacting requirement upon both the roll neck and gear lubricants.

These must, therefore, be compounded products, inasmuch as straight mineral lubricants will not withstand the continued washing action of hot water. The usual procedure is to compound the gear lubricant with definite percentages of certain substances which will give the final product the desired adhesive properties. Any rolling mill gearing, however, which does not come in contact with water can be lubricated readily with a straight mineral gear compound of a viscosity ranging from 2000 to 5000 seconds Saybolt, according to temperature conditions and the manner of lubrication.

Continuous Mills

The rolls of continuous mills in turn are driven usually by herringbone pinions and a set of relatively heavy gears. These pinions often are so constructed as to make it necessary to lubricate the bearings with

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grease, and to maintain a continuous flow of cooling water over them. Naturally this water will splash onto the pinions (where exposed), involving a condition and requiring a grade of lubricant such as has been mentioned above in discussing the blooming mill. Certain mills, however, may be built with oil-tight gear cases and suitable shields which will permit bath lubrication. This, of course, is the admirable condition, for the utmost of protection is afforded both the lubricant and the gear teeth.

According to the type of steel which is to be produced, it may be necessary to pass the resultant billets through another continuous mill, for further reductions in the size of the bars. In construction, operation and lubricating requirements, it will usually be similar to the one already discussed. The semi-finished product is then ready for delivery to the various finishing rolls capable of turning out an extensive variety of rounds, squares, flats and structural shapes.

Finishing Mills

In certain of such mills of the merchant type several sets of rolls depend for their operation upon one set of pinions. It can be appreciated, therefore, that the lubrication of these latter is decidedly important. For example, if there is any sticking, catching or chattering in the pinions, or if they mesh improperly or the points ride, by the time motion has been transmitted to the end rolls the faulty operation will have become considerably exaggerated.

Lost motion, in fact, may develop to such an extent as to interfere markedly with the finishing of the product. Where the final finishing rolls operate as individual units, this danger will, of course, be reduced greatly, although it always should be considered when selecting pinion lubricants. For this class of service the lubricant must be of relatively high viscosity and extremely adhesive, for water and heat conditions are usually quite as severe as elsewhere in the plant.

The bevel gears which drive the table rollers nearest to any type of rolling mill frequently operate exposed. They are therefore subject to water conditions, flying scale and the heat which radiates from the hot metal in its course through the mill. Here the gear lubricant is difficult to apply, in the first place, and furthermore, after it has been applied there is every obstacle put in the way of its functioning effectively. Centrifugal force will tend to throw it off, especially where it has suffered any extensive reduction in viscosity, due to overheating. The washing action of the water which splashes over such gears is also a detriment. In addition, excessive contamination by solid foreign matter hardly can be avoided, unless precaution is taken effectively to guard such gears.

Ultimate protection can be attained, therefore, only by frequent applications of a lubricant which has been so refined as to withstand these detrimental conditions. Usually the same product as recommended for the blooming mill gears must be used, having a viscosity of from 1000 to 2000 seconds Saybolt at 210 deg. Fahr., according to weather and temperature conditions involved. It should be applied by pouring onto the teeth at the point of mesh, while the gears are running inward. The frequency of application will, of course, depend upon the amount of steel rolled through the mill and the intensity of operation. In general, overlubrication leads but to waste, for a uniform film which covers the entire wearing surfaces is all that is necessary for their adequate protection. The application of any excess lubricant will simply mean that it will be squeezed out and probably thrown from the teeth in a short time.

Plate Mills

Plate mills present an additional detrimental condition, due to the quantities of salt which are thrown on the plates during the process of rolling, and also the fact that the hot plates pass directly over the bearings and gears of the table rollers. The purpose of salting is to remove the scale; oftentimes, water also is sprayed on the rolls. These factors, coupled with flying scale and dust driven with considerable force when the hot gases explode, tend to destroy any lubricant used on the roll necks, table roller bearings and gears. Types of mineral gear compounds as specified above have been found to withstand these detrimental elements satisfactorily, provided they are applied at frequent intervals and in sufficient quantities.

Such mills may be either of the two-high or three-high type, being driven by a corresponding set of herringbone pinions. In many cases these driving pinions are located in open housings, so close to the mills that it is impossible to protect them except by means of effective lubrication. Here an additional property which the gear lubricant must possess is an ability to resist being thinned out by the oil which is used on the pinion bearings, inasmuch as a good deal of this latter will often work out and onto the gear teeth, especially in older types of mills.

Roll Necks

Roll necks must be lubricated with a specially compounded roll neck grease that will not carbonize nor wash off when in contact with the water so often run over them to keep them cool. Lubricants used on such roll necks are termed cold neck greases. In general, they are tallow-mineral oil compounds, oftentimes being so prepared as to emulsify on contact with water. Frequently, however, water is not used; even where it is, the necks may run so hot as to melt down a cold neck grease. In such cases, a hot neck grease of high melting point must be substituted, even though added friction and wear may be developed.

Viscosity and Its Measurement

Viscosity or fluid friction is that inherent property by virtue of which the flow of liquids is retarded. It is therefore possessed by all oils, in varying degrees. In effect, it is the resistance offered by the particles or molecules of a liquid in sliding past each other.

Viscosity is commonly measured by taking the time required for a certain quantity of the liquid in question to flow through an orifice of standard size under standard temperature conditions. The Saybolt universal viscosimeter has been adopted for this purpose by the American Society for Testing Materials. In the oil industry it constitutes the measurement of the number of seconds required for 60 cu. cm. of oil to flow through the orifice at the standard temperature. For lighter products, such as engine and machine oils, this is usually 100 deg. Fahr. For heavier oils, such as gear compounds and steam cylinder oils, 210 deg. Fahr. is commonly used. Therefore, when an oil is referred to as having a Saybolt viscosity of 1000 sec. at 210 deg. Fahr., it implies that 1000 sec. will be required for 60 cu. cm. to flow through the standard Saybolt viscosimeter at 210 deg. Fahr.

The Screw-Down

As its name implies, this consists of two long screws driven by electric or hydraulic power; its purpose is to raise or lower the rolls, as necessary. While not subject to water conditions, nevertheless it also will receive considerable heat and perhaps its share of flying scale and dust. Therefore it, too, requires careful lubrication. These screws should be lubricated periodically with a fairly heavy grade of straight mineral, steam refined cylinder oil of a viscosity sufficient to withstand the high pressures involved.

Accessory Equipment

Lubricating requirements of accessory rolling mill equipment, such as saws, shears, electric cranes and cooling tables, etc., in most cases vary little from general roll lubrication. As a rule the same detrimental conditions which the working of hot steel involves are present, to reduce the effectiveness of lubrication. In other words heat, dust, dirt and high pressures must be combatted in practically all cases. Furthermore, certain types of high-speed saws also must be provided with cooling water. This usually is

applied to the saw as it leaves the cut. Unless suitable precaution is taken to prevent undue splashing, this water often will become an additional detriment to lubrication.

Saws are a factor of production in every steel plant where the smoothness of the finished material and the matter of waste or scrap are considered. In general saws can be adapted to either hot or cold cutting, according to the nature of the specification. Motor drives are usual on such equipment, the feeding of material in turn being brought about by means of motors, hydraulic, steam or air pressure, or hand operation in certain smaller machines.

All this equipment requires a nicety of construction and a smoothness of operation; otherwise, cutting will be materially affected. To bring this about, the builders have given careful attention to lubricating equipment; therefore, similar attention should be given by the steel man to the selection of the lubricants. While plain bearings and gearing will be chiefly involved, some high-speed saws are built with their arbors or main shafts mounted on ball bearings. Arbor bearings are subjected to the brunt of the work, and friction must be reduced to a minimum or it will tend to become cumulative.

Shears

While saws involve a considerably sustained pressure in operation, shears are subjected more to extreme shock and enormous loads, pressure being a factor only after the blade has begun its cutting work. Such a condition naturally imposes a severe strain upon the lubricant used on the gear teeth. In this case its body or viscosity is the salient factor, although it should always be highly adhesive, for we must remember that its primary duty is to resist the squeezing out action which occurs periodically between the gear teeth.

Double reduction gears are coming more and more into use in shear construction. It is reasonable to presume that the shock is thereby minimized by being distributed over a greater number of gears during the period of operation. The motive power employed involves the electric motor to a large extent, though steam and hydraulic power also are used. For example, the steam-hydraulic shear is especially adaptable for the cutting of blooms and slabs.

Other accessory equipment will involve conditions so akin to those already discussed that it is unnecessary to treat them in further detail. In general the same grades of lubricants can be used, viz: Black oils for rough bearing lubrication; straight mineral gear compounds of from 2000 to 5000 seconds viscosity Saybolt at 210 deg. Fahr. for gears and wire rope; a good grade of medium viscosity engine oil for motor bearings, and a graphite grease for the hydraulic plungers of manipulators, etc. As these latter are the "flywheels" of an hydraulic system and serve to equalize pressure and store energy, they always require careful attention.

Power Equipment

Essentially the power equipment necessary to the operation of the rolling mill includes electric motors and reciprocating steam engines of both the uniflow and counterflow types. Practice has been to limit the electric motor to the driving of such accessory equipment as shears, saws, tables and cranes; the steam engine being used heretofore as the prime mover on practically all roughing and finishing rolls. More recent developments in electric motor construction, however, have led to the perfection of a reversible machine which has been found readily adaptable to the driving of blooming mills in certain steel plants.

Blooming Mill Engines

In general the blooming mill steam engine will present the chief lubricating problem, due to its size, the differences in load which are prevalent, and the continual reversing to which it usually is subject. Depending upon the distance of the engine from the boiler house, the extent to which the lines are covered and the weather conditions, the steam delivered to the engine naturally will vary in pressure and superheat. Therefore its quality or moisture content often will be changing constantly. Periodic starting, stopping and reversing also tend to increase the amount of actual moisture which passes through the cylinders, due to condensation.

So the average blooming mill steam engine will operate on wet steam, oftentimes water conditions being so severe as to tend to wash the lubricant almost instantly from the cylinder walls. The extent to which moisture content and condensation may vary naturally precludes the selection of a grade of cylinder oil suitable for all conditions.

Theoretically, its compound content should be high, but oftentimes the possibility of returning oil back to the boilers makes it necessary to use a lubricant with as little animal compound as possible. So excess water conditions often must be met by an increase in the amount of oil fed to the engine cylinders. In fact, this is one place where theoretical feeding of cylinder oil at a definite rate of a certain number of drops per minute is often impracticable.

For steam cylinder lubrication in the steel mill it is generally advisable, wherever possible, to select one grade of cylinder oil which will best meet all the varying conditions that may occur. The use of a number of different grades of oil would be better theoretically, of course, but would in turn often lead to confusion, especially in plants where oil house management might be lax, or where an ignorant type of labor must handle the lubricants.

In other words, lubrication economy must be sacrificed to a certain extent in favor of general plant economy, and the necessity to keep running in a dependable manner. Use of excess lubricant in such cases is better than the attainment of theoretical maximum efficiency. For it might often develop into a case of "spare the lubricant and spoil the machine."

Engine Bearings

Lubrication of steam engine bearings must be considered from the viewpoint of the location and guarding of the engine. For example, where this latter is installed in a separate engine room, naturally conditions will be cleaner and the oil will not pick up so much dirt as it would were the engine exposed to usual operating conditions in the plant. Blooming mill engines in particular often are located in a room set aside for power plant equipment.

Unless provided with guards, however, to prevent oil from being thrown from the crosshead guides and crank pins, economy and cleanliness cannot be maintained, and these engines will be relatively no better off, from a lubricating point of view, than the machine located adjacent to the rolling mill. The frequency with which blooming mill engines start, stop and reverse, and their high operating speeds, lead to excessive splashing and throwing of oil from practically all the external parts. Often this oil is caught by suitable guards and returned to the system. Where it is deposited on the cylinder heads, however, it becomes a loss, due to its rapid vaporization.

Engines installed in the same building with the mill naturally are exposed to all the dirt, dust, particles of steel and scale so prevalent in such locations. Circulating oiling systems are the best protection for engine bearings under these conditions; essentially the problem is to maintain the oil in a suitable state of purity and as free as possible from external contamination.

A suitable oil purifier must always, therefore, be a part of such an installation, for it is practically impossible to prevent foreign matter from coming in contact with oil, especially on eccentrics, valve mechanisms and oftentimes the crossheads and crank pins. As a rule, a highly refined straight mineral oil of from 200 to 300 seconds Saybolt at 100 deg. Fahr. will meet the requirement as a general rolling mill engine bearing lubricant.

Motors

The electric-driven blooming mill, of course, eliminates the matter of steam cylinder lubrication. Periodic reversal in this case has practically no effect upon the lubrication of the motor bearings. To be sure, these are large and heavy, but so effectively have the principles of automatic lubrication been adapted that oiling

troubles are a rarity. Elsewhere in the plant electric motors usually are equipped for ring oiling. In either type of system, however, the usual engine oil as specified above for engine bearing lubrication will function satisfactorily.

Conclusion

In the steel plant, as elsewhere, there can be but one ultimate result of better lubrication, if it has been scientifically planned, i.e., increased efficiency. Increased efficiency constitutes essentially (a) an increase in production and (b) a reduction in power consumption. Therefore better lubrication is advisable; to what extent, inference may be drawn from the statement of authorities that as high as 1½ per cent increased production with approximately a 10 per cent reduction in power consumption is obtainable.

To reduce the benefits of scientific lubrication to a dollars and cents viewpoint is a most forceful way of driving home its advantages. To obtain these advantages it is but necessary to study plant machinery for the purpose of correcting, as far as possible, the more usual lubricating difficulties (as brought out above), which may be encountered, and to select lubricants to meet most effectively the operating conditions at hand.

NEW STEEL FOR SHIPS

Increased Elastic Limit of a British Product Claimed to Save 8.50 Per Cent in Weight

BY A. C. BLACKALL*

AN improved mild steel has recently been invented in Great Britain which possesses a far greater elastic limit than that ordinarily used in ship construction work. By the use of this material it is claimed that the plates of a vessel may be made considerably thinner and yet possess the same strength, and it will thus be possible to build a ship of given size lighter and therefore able to transport a heavier cargo with the same engine horsepower.

The idea bids fair, according to some authorities, to revolutionize both the shipping and shipbuilding industries. That the invention is past the experimental stage is proved from the fact that a vessel in which this material is employed is at present in course of construction at Greenock (Scotland). By the use of this new steel a saving of 8.50 per cent in weight of material used will be made without any reduction in either the strength or efficiency of the vessel.

The invention, which is causing a stir in the British metallurgical world, since it has long been recognized that any improvement in the quality of shipbuilding materials must be one of metallurgy, is that of F. G. Martin, chief chemist and metallurgist of the large firm of Liverpool shipowners, Alfred Holt & Co., owners of the Blue Funnel Line. Mr. Martin's work has been done in conjunction with David Colville & Sons, steelmakers of Motherwell (Scotland).

Although the invention has only just been put to practical use, it has been the subject of Mr. Martin's investigations since 1916. In that year one of the Holt steamers—the "Aeneas"—stranded. Mr. Martin tested the strength of the plates used in the construction of the vessel and came to the conclusion that their true elastic limit was in most cases too low. Such "elastic limit" is best described as the point to which the plates would stretch and yet return to normal. The elastic limit of the "Aeneas" was found to be only three tons to the square inch. The idea then occurred to Mr. Martin that had the vessel been constructed of steel with an elasticity of, say 12 tons per sq. in., the weight of the materials used would be far less. However, at that time it was exceedingly difficult to get any experiments made on account of such tests occupying about an hour, during which period all other operations were held up.

The idea at that time being found impracticable, further consideration was postponed until 1918, when Professor Dalby of London invented a machine giving elastic limit accurately and rapidly. It then was proved that the average figure for the true elastic limit was approximately 8 tons per sq. in. Satisfied of the practicability of the idea, in conjunction with Colville & Sons, the inventor worked out a quality of mild steel designed to provide a higher elastic limit and yet pass all required shipbuilding tests. Results having proved successful, Holt & Co. gave an order to construct a vessel with plates of the new material, the building of which was entrusted to Scotts Shipbuilding & Engineering Co. of Greenock.

The vessel is a cargo boat 425 ft. in length. A gain of 8.50 per cent means a saving of 250 tons in weight and also adds that amount to the vessel's cargo-carrying capacity, which in turn naturally means increased revenue when a full cargo is carried.

The first question that immediately presents itself is that of cost. The prime cost, it is true, works out at between 2 and 3 per cent higher than that of a boat built of ordinary steel, due to the slightly higher cost of manufacture, but against this has to be reckoned the additional carrying capacity on the same draught and the same horsepower for the same speed, which will, under normal conditions, place the vessel in a class of its own as more profitable than any other boat of similar size and design yet constructed. Notwithstanding the fact that the building of the vessel was originally undertaken as an experiment, both owners and builders are so confident of success that already a second vessel has been projected, although the first has not so far been tested.

Even at this early stage the question of making increased savings over the 8.50 per cent is being discussed, the idea being a further reduction in the scantlings. This, of course, will be done in cooperation with the Board of Trade and all the marine classification societies, who thus far insist upon the qualities of the new steel being thoroughly demonstrated before making further concessions.

*28 Howitt Road, Belsize Park, London, N. W. 3.

Wholesale Prices Higher in July

Bureau of Labor Statistics figures show a definite upturn of prices in July compared with June, being back on the May level. The index figure for all commodities in July was 147 compared with 144.6 in June and with 150.6 in July of last year. Principal among the increases was the item of farm products, which gained 6.9 points in the month; foods increased 3.1 points. Decreases were recorded in metals and metal products, fuel and lighting, building materials, and chemicals and drugs.

Except for farm products, all items are lower now than they were a year ago. The table shows the figures for the nine groups and the summary, for the current month, the preceding month and the corresponding month of last year, as well as the percentage reduction of the current month from last year. The largest reductions within the year were shown by the metals and metal products and building materials, both being more than 10 per cent:

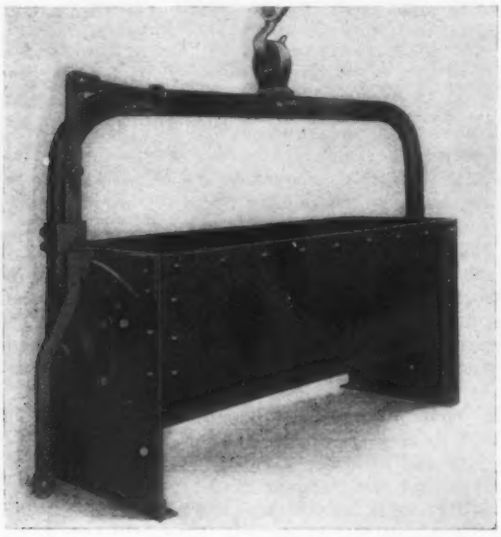
INDEX NUMBERS OF WHOLESALE PRICES BASED ON 1913 AT 100

Group	1923, July	1924 June	1924 July	Reduction in One Year, Per Cent
Farm products	135.1	134.0	140.9	*4.3
Foods	141.3	135.6	138.7	1.8
Cloths and clothing	193.1	187.2	187.5	2.9
Fuel and lighting	183.0	174.7	173.2	5.4
Metals and metal products	145.3	132.2	130.4	10.3
Building materials	189.7	172.7	168.8	11.0
Chemicals and drugs	128.5	126.6	126.5	1.6
Housefurnishing goods	186.7	171.8	170.8	8.5
Miscellaneous	130.7	111.1	112.4	6.9
All commodities	150.6	144.6	147.0	2.4

*Increase.

Self-Righting Charging Bucket for Malleable Furnaces

A self-righting charging bucket for use in charging malleable melting furnaces has recently been put on the market by the Whiting Corporation, Harvey, Ill. It is described as a standardized steel plate bucket for use in charging both sprue or pig iron. The load is dumped automatically when the latch is tripped, the bucket returning to the upright position when empty,



The Load Is Dumped Automatically When Latch Is Tripped, the Bucket Returning to Upright Position When Empty

as shown by the illustration. The bail of the bucket is detachable and only one is required for several buckets. A clear space is provided underneath so that it may be used with lift trucks. If preferred, the company also manufactures these buckets without the lift truck, providing instead an apron which can be used to increase the capacity when charging light scrap or sprues. The capacity of the bucket is 3000 lb. of pig iron.

Improves Hydraulic Scrap Metal Bundling Machine

A new No. 4 Tempus hydraulic scrap metal bundling machine, which is an improvement on that described in THE IRON AGE of July 27, 1922, has been placed on the market by S. H. Garrett, 234 North Thirteenth Street, Philadelphia.

The press may be mounted on a concrete floor and by means of a chute the bundle of compressed scrap may be delivered to any point within 1000 yd. Means may be provided for discharging the bundles alternately at different points around the machine, and the machine may be equipped with a measuring device to register the quantity of scrap bundled. As in the previous machine the feeding hopper is formed by dropping one side of the press to an angle of 55 deg. by means of a hydraulic cylinder through a combination rack and pinion and toggle movement. When the material fed into the press is of a bulky and light nature, the side or platen may be closed as often as necessary to pack the charge adequately. When the machine is charged to capacity, the platen is drawn up, whereupon it locks automatically, forming the first pressing movement.

The friction discharge chamber consists of a steel casting attached to the press by steel tie bars. Three sides of this chamber are chilled and one side has a movable section with a chilled face fitted into it. This section forms the resistance against which the scrap is compressed into a bundle. It may be set either to resist the full force of the hydraulic cylinder operating against it, or it may be set so that the pressure of the cylinder (100 tons) is available for conveying the finished bundle to the storage bin or freight car.

Valves and fittings are of Watson-Stillman Co. manufacture. The operating valves are of three way balanced packed plunger type and are grouped for convenient operation. The pump recommended is the Watson-Stillman horizontal pattern, four plunger type, each plunger being 1¾ in. in diameter, 12 in. stroke. Machine cut gears are used, and a base to receive a 50-hp., 750 r.p.m. constant speed motor is provided. The capacity of the pump is 25 gal. per min. against 3000 lb. pressure. It is mounted on a cast iron box which forms the reservoir into which the liquid is discharged. The plunger of the accumulator is 6½ in. in diameter and the stroke is 12 ft. A steel tank 7 ft. 6 in. in diameter and 12 ft. high is provided, and when the machine is loaded with scrap a pressure of 3000 lb. is produced by the plunger. An automatic relief valve provided for the accumulator serves to check the flow from the pump when the maximum load is reached.

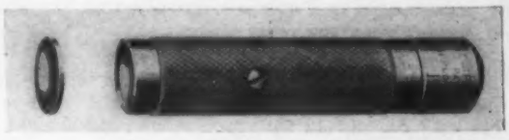
A complete cycle of all movements is said to be made in 45 sec. It is claimed that with the material to be bundled located conveniently, the output of the press should average 20 bundles an hour, each bundle measuring 12 x 12 x 24 in., and weighing approximately 200 lb. The drop side or platen of the press facilitates loading as it may be opened as soon as the vertical plungers finish their stroke, a large portion of the charge being put into the feeding hopper while the main plunger is completing a movement.

Tool for Setting Welch Core Hole Plugs

A tool known as the Eclipse Welch-plug set, intended for properly setting Welch expansion core hole plugs has been placed on the market by the Eclipse Interchangeable Counterbore Co., 7410 St. Aubin Avenue, Detroit. The device has been designed in cooperation with the M. D. Hubbard Spring Co., Pontiac, Mich., manufacturers of the Welch patent core hole plug.

The method of setting the plugs commonly used heretofore has been to insert the Welch plug in the counterbored hole in the casting, and then strike it with a hammer. A careless workman often misses the plug or hits it too hard, frequently causing in the first case a cracked cylinder wall, or in the second case a concaved plug, resulting in a leaky joint. The plug-setting tool illustrated herewith is intended to eliminate the possibility of injuring the cylinder wall or concaving the plug, the tool being designed so that no matter how hard it is struck, the Welch-plug will be dented the proper amount recommended by the manufacturer.

Nineteen sizes of the tool for plugs from ½ in. to 2¼ in. in diameter are available. They are of steel,



Tool for Use With Welch-Plug Sets, Preventing Cracking of Cylinder Walls and Concaving of the Plug

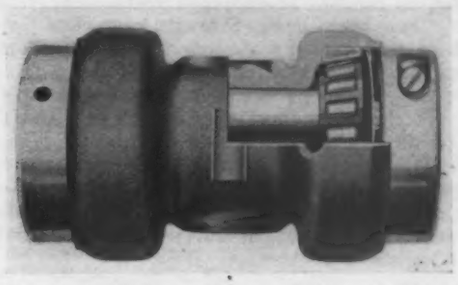
hardened and ground, the shell being of machine steel and the set of tool steel. A retaining screw prevents the two parts from becoming separated.

The compilation and publication of a complete catalog of the various kinds of castings into which manganese steel can be incorporated has recently been completed by the American Manganese Steel Co., Chicago Heights, Ill. The company claims that this is the first time that such a complete compilation has been printed. It is a general catalog, designated as No. 9, and is one of a series of nine publications. It is well illustrated and attempts to cover the entire ground so far as the unusual and diversified character of the manganese steel foundry industry permits.

New Lineshaft Bearing

A lineshaft bearing, equipped with Timken tapered roller bearings as shown in the accompanying illustration has been placed on the market by the Dodge Mfg. Corporation, Mishawaka, Ind.

In this hanger bearing, there are only five parts to the complete assembly. It consists of two Timken tapered roller bearings mounted on a ground and slotted steel tube and fitted to an accurately machined housing. The ends of the steel tube are threaded to receive clamping collars which are intended to provide accurate adjustment of the bearings on the tube. The mounting of the tapered roller bearings, as described,



Lineshaft Bearing Equipped with Tapered Roller Bearings

is intended to assure full utilization of the bearings for both radial and thrust loads, being said also to add to the ruggedness of the assembly and to be of particular value in resisting the side weave of heavy driving belts. Fastening of the steel tube or sleeve to the shaft is accomplished simply by setting up the screws in each of the two clamping collars.

Dust proof construction is a feature also emphasized. The sleeve on which the bearings are mounted extends from end to end of the housing and liberal grease compartments are provided inside of the housing and outside of the tube. The outer ends of the bearings are protected against dust by special metallic grease seals which are said to eliminate friction at this point and prevent dust working in or the lubricant from working out, the grease seals being designed to take the place of felt washers or packing.

In erecting the new lineshaft bearing it is only necessary to slip the bearing over the shaft and set up the clamping screw in each of the split clamping collars. In removing the bearing the collar screws are loosened and the bearing slipped off the shaft.

Industrial-Economic Conditions in the United States

Under the above title the National Industrial Conference Board, New York, has issued a 36-page pamphlet reflecting the state of business and indicating the considerable betterment in sentiment which took place during July. Business as a whole during the first half of 1924 passed through a stage of sudden recovery from the declining trend in the last half of 1923 and then resumed the downward trend again. Production during January and February was too great for consumption to keep pace, which fact resulted in a curtailment in manufacturing industries, becoming rapid in some lines.

Attention is called in the report to specific figures of operation of various industries, to the movement of wages in conjunction with the labor supply through immigration and otherwise, and to the hours of labor, cost of living, and relation of the latter to the wage earner's income.

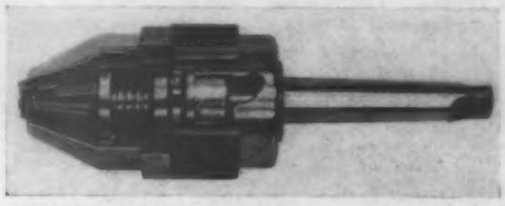
Trade and finance discussed in the last two pages close the story. This item covers the volume of retail trade as shown by reports of large mail order houses and others, a discussion of imports and exports, of commercial failures and new capital issues, and ends with a statement of the decrease of almost $1,100,000,000 in the national debt during the year ended June 30.

Quick-Change Drill Chuck

A quick-change drill chuck known as the Neudeck, for straight shank drills, and for which several advantages are claimed has been placed on the market by the MP Trading Co., Fifteenth and Mt. Vernon Streets, Philadelphia. The chuck has been previously marketed in Europe.

The general construction of the chuck may be noted from the accompanying illustration. It consists of a Morse taper arbor terminating at its lower end in a wedging plate with three prongs adapted to retain the three conical clamping rollers. Other parts are the cylindrical upper body, the knurled operating sleeve, the cone-shaped lower shell screwed in the cylindrical upper body, and a spring casing with a helical spring, one end of which is fixed to the casing and the other end curled to engage a slot in the arbor. There is also a beveled pressure disk, a ball retaining ring, a spring ring, and a flanged nut with a left-hand thread to correspond to the thread on a portion of the arbor.

In holding the knurled operating sleeve while the drilling machine spindle is running, the chuck housing is temporarily held stationary, while the arbor of the chuck continues to rotate. The threaded portion of the arbor inside of the chuck assembly engages the flanged nut, simultaneously winding up the spring, the latter engaging the arbor by means of an elongated slot in the arbor. The wedging plate at the lower end of the arbor is provided with a stop pin which, as the threaded nut feeds down toward the plate, enters a curved stop pin groove in the flange of the nut. This causes the chuck housing, which has been stationary, to rotate with the arbor as soon as the stop pin strikes the end of the stop pin groove. The threaded flanged nut is set so that the



Quick-Change Drill Chuck for Straight Shank Drills

stop pin strikes the end of the curved groove just before the spring is fully wound around the arbor. The spring remains in this position as long as the operating sleeve is retained. The spring is not subject to any strain.

By holding the knurled sleeve while the arbor is rotating, the threaded flanged nut is forced down toward the wedging plate of the arbor. This causes the wedging plate with its three prongs to recede within the conical shell carrying with it the conical clamping rollers, which by centrifugal force fly against the wall of the conical shell, thus spreading apart enough to permit insertion of the drill. When the knurled sleeve is released, the spring action forces the chuck housing and threaded flanged nut back, away from the wedging plate. This causes the wedging plate with its prongs carrying the clamping rollers to be forced toward the conical shell until the rollers embrace the shank of the drill and are wedged between the wall of the conical shell and the drill shank.

A ball bearing release mechanism is provided to facilitate opening the chuck while the drill spindle is running at full speed. Vertical thrust on the ball retainer is taken up by a spring ring, providing, it is said, quick and positive release. All working parts are hardened and ground and all parts are interchangeable.

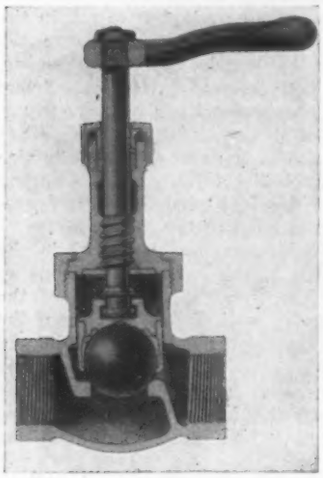
Quick changing of drills, unusual durability, and the saving of drills because the smooth conical clamping rollers eliminate mutilating and scoring of the drill shank are among the advantages claimed. Four sizes of chuck for drills from No. 55 to ⅞ in. are available.

Price tables of phosphor bronze in sheets, rolls and rods have been issued by the American Brass Co., Waterbury, Conn.

Valves with Ball Closing Feature

Globe and angle valves, a feature of which is the phosphor bronze ball which is held freely in place in a removable cage attached to the valve stem and which acts as the closing member, are being offered by the Coy Valve Co., Chehalis, Wash.

The position of the ball may be noted in the accompanying cross section view of the valve. The removable cage is attached to the valve stem by means of a flexible joint, permitting the ball to rotate freely, constantly changing the seating surface. This construction is intended to prevent wear and corrosion and permit of free flushing of the ball and cage. The cage and spherical shape of the ball are said to assure proper alinement on the seat, preventing leaks.



The elimination of straight lines in the design of the body is intended to lessen resistance to the flow of water or steam. The body is heavy and has extra large pipe threads tapped to American Briggs Standard gage. The union bonnet permits convenient accessibility to the seat, and has a flat seat at the neck to assure proper contact with the body. The stem is of special bronze. The stuffing box is fitted with a gland or follower and is packed with durable asbestos ring packing. Repacking may be done when the valve is wide open and under pressure, because the shoulder on the spindle fits into the seat in the bonnet, forming close contact and shutting off the steam or water from the stuffing box.

Five sizes of the valve, from ½ to 1½ in., are available. They are tested up to 500 lb., hydrostatic test, before shipment and are rated as suitable for 200 lb. steam working pressure.

Lock for Electric Light Bulbs

A device known as the Ren-Lock and intended to prevent the theft of electric light bulbs, has been placed on the market by the Ren Mfg. Co., Winchester, Mass. It is adaptable to standard bulbs and standard brass sockets, but is not intended for porcelain or weatherproof sockets. It is claimed that when the lamp is locked in by means of the device, it cannot be removed except by breaking the glass. A special bag is provided for this purpose. The device is made up of only two parts, a coiled spring and a grooved fibre washer, and a special punch is provided for attaching the device to the lamp socket.

Manufacture in Saws in 1923

Census Bureau reports show that 79 establishments engaged in making saws in 1923 turned out products to the value of $30,641,858, compared with $18,185,297 from the same number of establishments in 1921, a gain of 68.5 per cent. The number of wage earners increased 42.4 per cent, from 3788 to 5394; the amount of wages 64.1 per cent, from $4,086,840 to $6,706,765. The value added by manufacture increased by 79.1 per cent, from $11,705,384 to $20,964,888. The horsepower used in 1923 was 13,284, while 58,292 net tons of coal were burned.

Twelve of the establishments were located in Massachusetts, eleven in New York, nine in Illinois, nine in Ohio, eight in Pennsylvania, seven in Michigan, and the remaining 23 in 16 other States.

Detroit Machine Tool Co. Consolidates with Norton Co.

The Detroit Machine Tool Co. of Detroit, has been consolidated with the Norton Co. of Worcester, Mass., manufacturer of grinding wheels and grinding machines. The Detroit Machine Tool Co. has been a pioneer in developing, manufacturing and marketing a centerless grinding machine.

No change in the business policy of the Detroit Machine Tool Co. is to be made. Harold W. Holmes will continue as president and general manager and Detroit Machine products will be manufactured in the modern plant at 6545 St. Antoine Street, Detroit, as before.

In many articles which previously could not be ground, on account of excessive costs, improvement in quality has been made through centerless grinding, which is now used by manufacturers of automobiles, automobile parts, bearings, typewriters, adding machines as well as by many other manufacturers. In fact centerless grinding is in its infancy and the extent of its future possibilities are not fully known.

The following officers and directors of the Norton Co. have been added to the board of directors of the Detroit Machine Tool Co.: Clifford S. Anderson, vice-president, Henry Duckworth, treasurer, William La-Coste Neilson and Aldus C. Higgins.

Sanford Riley Company Buys Canton Stoker Plant

The Sanford Riley Stoker Co., Worcester, Mass., has purchased the plant, assets and good will of the United Machine & Mfg. Co., Canton, Ohio, which manufactures an automatic stoker of a type which rounds out the Riley company's line. The Canton company has a capital of $450,000 and employs about 200 men. The new owner will continue to operate the Canton plant, but the headquarters of the business will be in Worcester. The Riley Stoker Co. hitherto has built stokers to handle automatically bituminous coal only. The United Machine & Mfg. Co.'s stokers feed to the boiler grate smaller sizes of anthracite, coke, and low grades of fuel, including lignite and the refuse from coke plants. The Riley company now operates works in Worcester, Detroit, Decatur, Ill., Toronto, Canada, and Canton.

Colburn Works Goes to Rochester

The Consolidated Machine Tool Corporation announces that two of its subsidiary companies, the Colburn Machine Tool Works and the Betts Machine Works, have effected a physical consolidation in the plant of the Betts Machine Works, Rochester, N. Y. The Colburn plant at Cleveland will presumably be disposed of, although the announcement makes no mention of the disposition to be made of it. The physical consolidation of the two plants, the principal product of both being boring mills, is stated to be in the interest of economy of manufacture. The general offices of the Consolidated Machine Tool Corporation, which for some time after the formation of the corporation were in New York, were subsequently moved to Rochester, but now are located at Wilmington, Del., which is the home of the Hilles & Jones Co., one of the subsidiaries of the corporation.

In a personal item on page 286 of THE IRON AGE of July 31, a typographical error led to the statement, "The Union Carbide & Carbon Corporation was probably the first industrial organization to make X-ray research the major department in the laboratory." It should have read "a major department."

The Smith & Wesson Co., Springfield, Mass., firearms plant, closed July 12, will remain so indefinitely, according to a statement recently issued by the management. Approximately 500 employees are affected.

Program for British Institute of Metals Autumn Meeting

The autumn meeting of the Institute of Metals (Great Britain) will be held in London, Sept. 8 to 11. The program of technical papers is as follows:

"A Method for Measuring Internal Stress in Brass Tubes," by Robert J. Anderson and Everett G. Fahlman.

"The Application of the Ideal Solubility Curve to the Interpretation of Equilibrium Diagrams in Metal Systems," by D. H. Andrews and Prof. John Johnston, (New Haven, Conn., U. S. A.).

"Seventh Report to the Corrosion Research Committee of the Institute of Metals," by Guy D. Bengough and R. May, (London).

"Comparative Results on Copper-Silicon-Aluminum and Other Aluminum Alloys as Obtained on Separately Cast Specimens and Specimens cut from a Crankcase Casting," by E. H. Dix, Jr. and Lieut. A. J. Lyon.

"The Determination of Sodium in Aluminum," by D. M. Fairlie and G. B. Brook.

"The Extrusion of Brass Rod by the Inverted Process," by R. Genders.

"Investigation of the Effects of Impurities on Copper. Part II.—The Effect of Iron on Copper," by D. Hanson and Grace W. Ford.

"The Relationship between Tensile Strength, Temperature and Cold-Work in Some Pure Metals and Single Solid Solutions," by Douglas H. Ingall.

"On the Effect of Progressive Cold-Rolling on the Brinell Hardness of Copper," by H. Moore.

"Experiments on the Working of Nickel for Coinage," by Sir Thomas K. Rose and J. H. Watson, (London).

"Some Experiments on the Effect of Casting Temperature and Heat Treatment on the Physical Properties of a High-Tin Bronze," by Francis W. Rowe.

"Some Experiments on the Influence of Casting Temperature and Mass on the Physical Properties of Admiralty Gun-Metal," by Francis W. Rowe.

"Studies in the Aluminum-Zinc System," by Tomojiro Tanabe.

"Metal Spraying and Sprayed Metal," by T. Henry Turner. and W. E. Ballard.

Fall Meetings of A. S. T. M. Metals Committees in Washington

In furtherance of the plan successfully inaugurated last March at Pittsburgh of having as many as possible of the metals committees of the American Society for Testing Materials, hold their meetings during a designated "committee week," arrangements are being made for holding the fall meetings of a number of these committees in Washington during the latter part of October, probably at the Bureau of Standards, thus affording opportunity to become better acquainted with the work of the bureau, particularly as relating to metals. It is expected that from seven to nine of the committees will join in these meetings. Further announcements, including dates and places of committee meetings, will be mailed to the members of the committees participating.

Round-Table Discussion on Electric Furnace Cast Iron

The American Electrochemical Society, through its electrothermic division, has arranged to hold a round-table meeting and discussion of electric furnace cast iron, on Thursday noon, Oct. 2, at the Hotel Tuller in Detroit, Mich. This is on the first day of the society's fall meeting, which is set for Oct. 2 to 4 in Detroit. All persons interested in electric furnaces or in cast iron or in the melting and treating of cast iron in electric furnaces, whether members of the society or not, are invited to attend this meeting which will be preceded by a luncheon of the interested ones. As in the case of previous successful round-table meetings of this society, there will be no papers read, and the discussion will be kept as free, informal and intimate as possible. Since none of the proceedings or discussion will be printed in any form whatever those who wish to benefit by the meeting will have to be present themselves or send representatives.

George K. Elliott, chief metallurgist Lunkenheimer Co., Cincinnati, who is chairman of the society's electrothermic division, is making the arrangements for the round-table and will serve as chairman of the meeting. Mr. Elliott, who himself is one of the pioneers in the field of cast iron electro-furnace metallurgy, announces that Dr. Richard Moldenke will be present and make the opening discussion, while others well known in the fields of cast iron and electric furnaces have announced their intention to be there. The aim is to have present electric furnace builders, electric furnace users and prospective users, metallurgists, iron foundrymen, and representatives of central stations manufacturing the electric power.

World Motor Transport Congress

Under the auspices of the National Automobile Chamber of Commerce, New York, are being published the addresses made at the Transport Congress in Detroit, held May 21 to 24. The series on automobiles and motor trucks, covering seven papers and 20 pages, and that on motor buses and taxi cabs, covering seven papers and 16 pages, have been just issued. In both cases the papers and discussions have been edited and the vital phases presented in the pamphlets.

German Results with the Schuermann Cupola

Some of the results obtained in Germany with the Schuermann or side blast cupola (described in THE IRON AGE, Oct. 19, 1922), were presented by Dr. S. Wernher in a paper at the International Foundry Trades Exhibition, recently held in Birmingham, England. The cupolas as used were equipped with pre-heaters and consisted essentially of two chambers, arranged at each side of a cupola, through which the blast of air is passed alternately before it enters the cupola.

According to the brief abstract of Dr. Wernher's paper, tests were run under exactly similar condition on cupolas with and without a Schuermann attachment. These show that the charge of coke used was 13 and 8 per cent respectively, and that the temperature of the iron was 50 to 60 deg. C. higher, and of a slag 80 to 100 deg. C. higher with the attachment. He reported also that there was a total saving of 35 per cent. Other benefits of the pre-heater furnace were the improved chemical properties of the iron produced and the use of larger amounts of scrap in charging.

COMING MEETINGS

August

Young Men's Christian Association. Aug. 28 to 31. Annual industrial conference on human relations, Silver Bay on Lake George, N. Y. J. Parke Channing, Miami Copper Co., 61 Broadway, New York, chairman.

September

Iron and Steel Institute. Sept. 4 and 5. Fall meeting, British Empire exhibition at Wembley, England. George C. Lloyd, 28 Victoria Street, London, S. W. 1, England.

National Sheet Metalware Association. Sept 9 and 10. Annual meeting, Hotel Statler, Buffalo, N. Y.

American Society of Mechanical Engineers. Sept. 15 to 18. Machine tool exhibit, Mason Laboratory, Sheffield Scientific School, Yale University, New Haven, Conn. For catalog and tickets, address Prof. S. W. Dudley, 400 Temple Street, New Haven, Conn.

American Society for Steel Treating. Sept. 22 to 26. Annual convention and exhibition. Headquarters, Copley-Plaza Hotel; exhibition, Commonwealth Pier, Boston. W. H. Eisenmann, 4600 Prospect Avenue, Cleveland, secretary.

American Mining Congress. Sept. 29 to Oct. 4. Annual convention, Sacramento, Cal. J. F. Callbreath, 814 Munsey Building, Washington, secretary.

New Types of Bearings for Rolling Mills*

Interesting Results from Application to German Mill Practice—Staggering of Special Bearings—Automatic Lubrication

BEFORE going into the merits of the new roller bearings which have been tested with marked success in the Witkowitzer Eisenwerk, it should be mentioned that this company has always been a leader in the field of bearings and of lubrication of roll necks. On all mills, from the blooming mill to the finishing mill, automatic lubrication for ordinary roll bearings (with sliding surfaces) has been applied in addition to the water cooling. Although this lubrication appears at first to be too complicated and to be unfit for heavy mill service, it soon proves the contrary by its excellent and simple manipulation. The bushings are finished all over, which offers the advantage of a perfect contact of the running surfaces right after putting the bearings in place, eliminating their grinding onto the roll necks through operation of the mill. The wear on bearings and roll necks as well as the consumption of power is reduced to a minimum. The method of lubrication at Witkowitz in conjunction with the finished "slide-bearings" makes run-down and worn roll necks impossible.

Bottom Bushings with Flanges

In order to catch the grease running from the roll necks, or rather to keep it on the necks, Witkowitz designed the bottom bushing with upward extended flanges. Through this arrangement the upper part of the roll neck, the body of the roll bearing, and the upper extensions of the flanges form a hollow space which catches the excess grease and keeps it at the roll journal. Even big roll necks can be lubricated satisfactorily by using this arrangement, which creates rather large grease containers, thus making it unnecessary to conduct the grease under pressure into the bearings. Fig. 1 shows these bearings, for which patents are granted to Witkowitz.

Fig. 1—Roll Bearings and Bushings with Upward Extended Flanges

A further improvement, also patented, on 3-high mills is that the necks of the middle roll run in well-fitted and Babbitted steel bushings. These bushings are made with a close fit for the bodies of the bearings, which are held rigidly in the roll housings, thus preventing a jumping of the middle roll when the billet enters between the rolls. The bearing bodies for the middle roll are made in one piece, which gives added strength over customary split bushings. These bearings may only be used in connection with as perfect a lubrication as in Witkowitz.

Without this system of lubrication the bearings might run hot and melt the bearing metal. As the bushing wears, thus changing roll alinement, the bushing is turned, affording new points of contact or bearing surface between the roll neck and bearing metal. It is recommended that the top roll also be provided with such a bearing in order to simplify the suspension and adjustment.

Pendulum Bearings for Rolls

Striving to improve the roll bearings further, Witkowitz has designed roll bearings with SKF roller or pendulum bearings. The difference between Witkowitz's design of these bearings and the Kladno design is that at the former roll and neck are one piece; in the latter the necks are made of hardened and polished steel and shrunk into the roll body.

The Witkowitz roller bearings (SKF) are able to take up the axial thrust, whereas Kladno bearings need bronze thrust rings which naturally increase the friction. In order to cut down the wear, Kladno lately is using hardened and ground steel rings bolted to the roll body and resting against the bronze rings. On rolls where a decided axial adjustment is required, Witkowitz uses a double-acting ball thrust bearing. To insure a maximum strength of necks on small diameter rolls Witkowitz staggers the roller bearings of adjoining rolls, i.e., the bearing on the middle roll is either nearer to the center line of the roll stand, or further out than the bearings for the top and bottom rolls.

This "staggering" of the roller bearings can, of course, only be applied where an existing stock of rolls does not have to be taken into account. However, Witkowitz has succeeded in also equipping existing rolls with roller bearings. Fig. 2.

Double Row Self-Adjusting Roller Bearings

Figs. 3 and 4 show the double row self adjusting (SKF) roller bearing, which is able to take smaller axial thrusts without increasing the friction. Bigger axial forces require ball thrust bearings. After the setting of the rolls, a combination of these two kinds of bearings eliminates almost any further adjustment as there is practically no wear at proper dimensioned bearings.

At such equipped 3-high mills, the middle roll is held without any axial movement; top and bottom rolls have axial adjustment. The two bearings for the top roll form one rigid unit, thus enabling a better alinement and adjustment. The same takes place for the bottom roll.

Experience has shown that, with some practice, roll changing can be performed with these roller bearings at least as quickly as with ordinary roll bearings, as there are fewer parts to change and adjust. After

*Abstracted from *Stahl und Eisen*, April 17, 1924, by Karl W. Atwater, Pittsburgh. The author is D. C. Holzweiler, Wiesdorf-Köln, Germany.

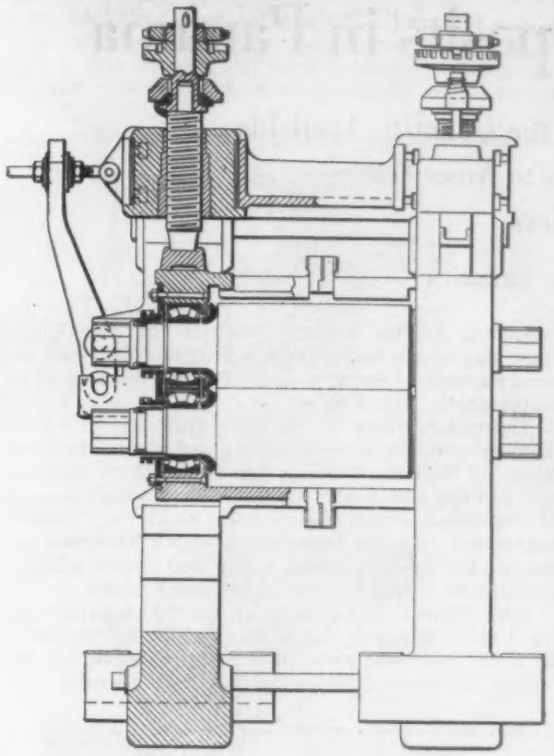
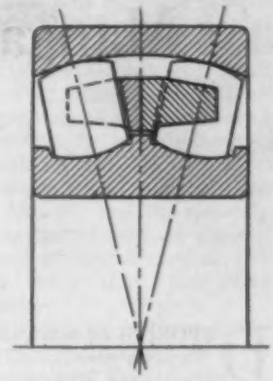
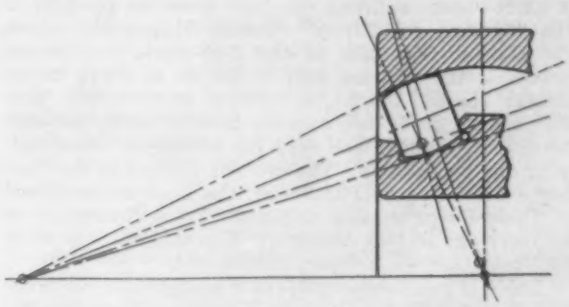
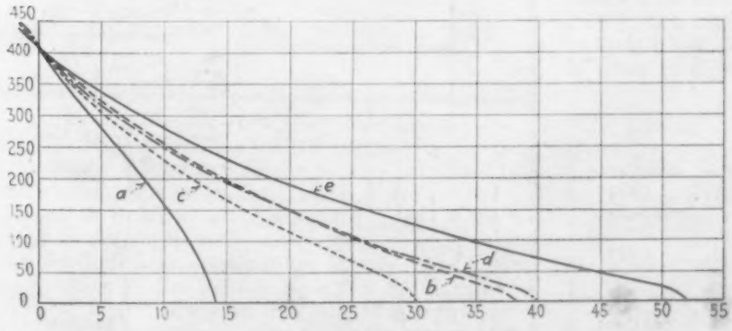


Fig. 2 (Left) — 10⅞-in. Diameter Roll Stand (277 mm.) with Roller Equipped Bearings



Figs. 3-4—Diagrams of S.K.F. Bearings





			Starting Speed in r.p.m.	Time to Run Out
Curve a	-	- 3 stands ordinary bearings	a 410	14 min. 16.6 sec.
Curve b	motor + flywheel	+ 3 stands roller bearings	b 410	38 min. 20 sec.
Curve c	+ pinion + roll	+ 3 stands roller bearings	c 450	31 min. 54 sec.
Curve d			d 450	41 min. 41 sec.
Curve e	motor + flywheel		e 440	53 min. 38 sec.

Fig. 5 (Left)—Results of Tests on the 11-in. Diameter (288 mm.) Finishing Mill with Ordinary and Roller Bearings. The ordinates represent revolutions per minute and the abscissae run-out time in minutes

loosening the flange bolts which connect the bearings on both sides of a roll to a unit, the two parts complete with roller bearings and ball thrust bearing can be removed. The more accurate interior parts of these bearings are not accessible to the man at the roll who receives for roll changing from the millwright the completely assembled unit.

Tests Made on 11-In. Roll Stands

Tests made in Witkowitz on three 11-in. roll stands, running idle, however, showed 69 per cent decrease of power when roller bearings were used. (An ordinary roll bearing required 1.02 kw., a roller bearing only 0.325 kw.). Tests under load have not been made so far, but it is apparent that the reduction of friction would remain at the same ratio.

On the test mill 3053 tons = 27,000 ft. of rolled sections have been produced and no wear nor damage has shown up on the roller bearings. Rolled sections were ¼ to ½ in. round, ½ to 3¼ in. wide flats. The above tonnage corresponds to 9,230,000 productive revolutions or a total number of 15,182,000 revolutions.

The roller bearing equipped mill in Witkowitz gave the results expected. The adjustment of the rolls is done exactly, after which a readjustment is hardly necessary. Therefore the rolled sections become more accurate than with common roll bearings. Consequently a decrease of weight tolerances and of overweight is assured and thereby a certain liability to the sale reduced. Even without water cooling and at the heaviest service the rise of temperature of the roller bearings is not worth mentioning.

Forced lubrication has been adopted. Although a small supply of grease is necessary, it is important to grease continuously in order to keep cooling water and sinter out of the bearings. The dismantled bearings exhibited for my inspection were still filled with absolutely pure grease without any sinter.

There is no doubt that today the roller bearing will be the bearing of the future for mills up to about 17 in. roll diameter and should be used at every new installation of such mills.

It was stated in THE IRON AGE of Aug. 14 that one of the South Chicago blast furnaces of the Illinois Steel Co. was seriously damaged in an accident on Aug. 4. The furnace which was damaged is at the Gary, Ind., works and not at South Chicago. It is expected that the shell of the stack will be rebuilt.

For coating damp or wet masonry the Truscon Laboratories, Detroit, have brought out a hydraulic paint known as "Stuccotex."

Manganese Ore Deposits in Panama

A Survey of the Mines and the Quantity Available —Early Shipments to American Consumers

BY CAPT. JOHN F. SHERIDAN

DEPOSITS of manganese occur in the province of Panama and Colon, and have been worked by the Caribbean Manganese Co., an American company, which removed only the manganese on the surface or blanket, taking out over 60,000 tons about 23 years ago. A narrow gage railroad was built from the foothills of the "Serrano del Darien" (Darien Mountains) where the blanket formation of the high-grade manganese occurs, to the shipping port of the ore at Playa de las Damas (Ladies Beach), a distance of 13 miles. This was a high grade ore, running from 70 to 82 per cent manganese dioxide, and very low in copper, silica, sulphur and phosphorus. The ore was shipped to the Carnegie Steel Co., at Pittsburgh, the analysis as shown in Table I representing shipments from Panama, over 25 years ago to that company. The analysis was made by Booth-Garrett & Blair, Philadelphia.

Table II represents analyses of manganese ores taken at different periods of time and locations. These demonstrate the comparative equality of Panama ores, showing high metallic manganese and low silica and copper. This ore compares very favorably with the Brazilian and India manganese ores, now being used by some of our largest steel manufacturers.

Table I.—Analysis of Manganese Ore from Panama for Carnegie Steel Co.

	Per Cent
Moisture	1.643
Manganese (Mn)	55.590
Silica ($Si O_2$)	0.900
Phosphorus	0.028

Table II.—Analysis of Panama Manganese Ore in General

	Per Cent
Manganese dioxide ($Mn O_2$)	84.20
Iron	2.12
Copper	0.15
Manganese (Mn)	57.99
Silica ($Si O_2$)	0.78

Manganese Ventures in Panama

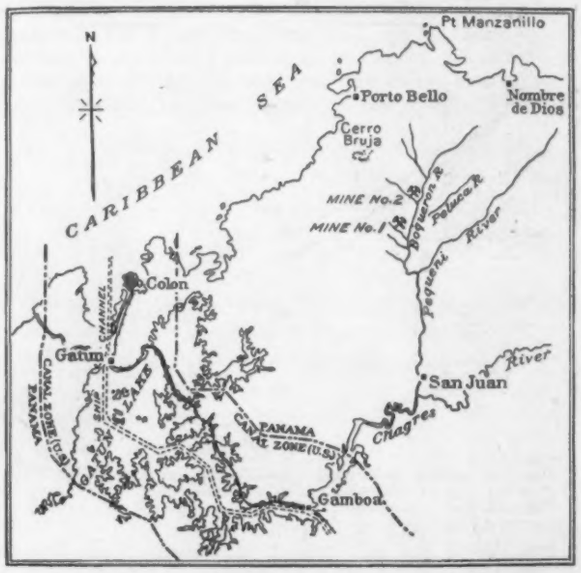
A few years later, Minor C. Keith, John Pophan and Jesse Hyatt, American business men, removed a manganese blanket of about 20,000 tons, back in the foothills from Nombre de Dios (Name of God). This last named port, local legends state, was the anchoring ground for one of the first ships of the great Genoese navigator, Christopher Columbus, to land on the Western Continent.

About 12 years ago, the U. S. Canal Commission engineers dredged out a big canal about 200 yd. back of the Nombre de Dios to obtain the fine sharp sand that was necessary for the construction of the locks and retaining walls of the Panama Canal. This sand was near a manganese float deposit.

Minor C. Keith was one of the first American pioneers to go into Costa Rica and Panama and tap the rich natural resources of both countries laying the foundation for the present greatness of the United Fruit Co., whose holdings in acreage of bananas and cocoa plantations are vital factors in the markets of the United States and Europe.

The ramifications of the little fruit importing and shipping company were organized and started by a Mr. Benson of Boston. Aided by the Costa Rican, Panamanian control, and South American land acquisitions of his very able business associate, Mr. Keith, they have increased to a shipping organization—both passenger and freight, and banana, cocoa, coffee and fruit—which is regarded as second to none in the world today.

John Pophan had charge of the "Abengares" and "La Unión" mines in Costa Rica, which are owned by the Keith interests; and "General Silent John," as Mr. Pophan is known in Panama, has only recently completed a 22-kilometer narrow gage railroad from the railhead on the Pequení River to Nombre de Dios to take out a blanket of manganese of approximately 50,000 tons, operated by a Keith-controlled manganese company of Philadelphia.

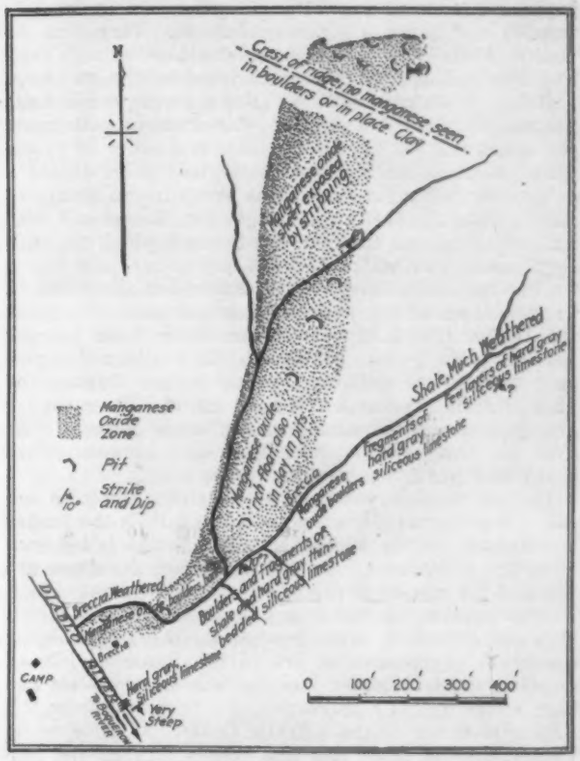


Location of Manganese Mines, Nos. 1 and 2 in Panama

The manganese on the Pequení River and adjacent territory is as high in manganese dioxide and metallic manganese, as the ores taken out years ago by the Caribbean Manganese Co. The only reason which can be ascribed for these companies operating on the surface only and not going deeper is because the cost of blanket removal is very low and no machinery is necessary, except a small Thew or Bucyrus shovel for loading the dump cars. But even this outlay can be avoided,

THE author of this article is a mining engineer and was formerly a Government engineer for Mexico, Santo Domingo, Venezuela, Panama, etc. He has spent several years prospecting in many sections of Panama and other countries. Captain Sheridan states that manganese and other ores exist in abundance in Panama. He emphasizes the importance of this because of the proximity to the United States.

and it has been avoided in the past, by loading the cars by manual labor at an average cost of 5c. to 7c. per hr. for native labor. There has been a great deal of money made in this manner, and more may be expected to follow when the blankets and deposits, as shown by the


N
Crest of ridge; no manganese seen in boulders or in place. Clay
Manganese oxide sheet exposed by stripping
Manganese Oxide Zone
Pit
Strike and Dip
Manganese oxide rich float also in clay in pits
Breccia
Manganese oxide boulders
Fragments of hard gray siliceous limestone
Few layers of hard gray siliceous limestone
Shale, Much Weathered
Breccia Weathered
Manganese oxide boulders
Boulders and fragments of shale and hard gray thin-bedded siliceous limestone
Hard gray siliceous limestone
Very Steep
CAMP
0 100' 200' 300' 400'

Float Cap Running Into Mines Nos. 1 and 2

accompanying maps, are developed and operated both on the surface and in depth.

Mining men, who read this article and who are interested in the cheap production of a high grade manganese for American consumption, would do well to pay close attention to the location as given in the maps in particular, and to Panama in general, as it will be a factor to be reckoned with some day in our raw mineral and metal ore markets in the very near future, as the raw products are there in abundance.

Panamanian Ore Deposits in General

Mine No. 1: The ore at mine No. 1 is a mixture of oxides of manganese. It is hard, black and, for the most part, very pure. In places it is segregated in lenses and sheets in clays of various colors but it is not in contact with any hard rock. Much of the manganese oxide in this mine is in boulders. At the point marked 1 on map No. 2, in the stream (Boqueron River) near the camp, are several boulders, each containing over 100 tons of extreme pure, hard ore. In November and December, 1918, these boulders were being broken up, and 100 tons of the material was being bagged and shipped by cayuca (native dug-outs) down the river to Colon for careful assays and shipment. Several branches of the stream are lined with small and medium-sized boulders.

Another branch of this stream (not shown on the map), about a quarter of a mile northeast of the camp, is lined with large and small boulders of good ore that will yield not less than 3000 tons. All of this material, together with the thick float seen on the hill between location No. 2 and the camp, is readily available with practically no sorting. At numerous places, close to the surface boulders, shallow pits show more manganese oxide in the banks surrounded by clay. See the sketch map of mine No. 1, near Boqueron River, Panama, showing zone of manganese ore (outcrop and float).

On the north slope of the hill below locality No. 2 a number of pits and trenches show ore in place, in contact with red and brown clays, but no hard rock. In these pits the ore has merely been exposed but not yet removed, so that it is not known how deep the mineral extends; however, at one place a drill passed through 8 ft. of ore into clay, which may be only a stringer or parting. On top of the hill a north-south cut 60 ft. long shows a continuous floor of manganese, and, on the south slope where extensive stripping has been done, the ore is exposed in a zone 100 ft. wide, extending down the hill to the first small stream. In several of the cuts the contact of the manganese oxide and the clays has a dip of about 30 deg. W., and the distribution and appearance of the manganiferous rock suggest a sheet or zone of ore inclined in that direction. No evidence of faulting was seen, except that a few small pieces of ore showed slickensides.

The manganese oxide is evidently of secondary origin, being the result of concentration and segregation in the residual clays which have been formed by the weathering of the older rocks. This mode of origin is one commonly observed in manganese ore deposits.

Because of the absence of good exposures near by and the lack of bedding in the streams, it is thought unwise to do more than suggest the possibility that the manganese may extend farther underground in this zone, which should be tested by deeper pits. However, the great quantity of boulders and float and the extent of the zones exposed by cuts indicate that 10,000 to 15,000 tons is without doubt easily available.

Mine No. 2: The ore at mine No. 2 is in boulders in a zone along a branch of Diablo River and up the slope of a steep hill between two of its forks. Near the river the zone of boulders is only 30 to 40 ft. wide. Some of them lie on the surface and some are buried in the clap banks. Farther upstream the zone widens and between two branches shows a rich heavy float. Several pits expose good manganese oxide in clay. The south slope of the hill has been extensively stripped and good ore is found, roughly following the surface of the slope.

Float Cap and Manganese Boulders in Mines Nos. 1 and 2

This sheet ranges in thickness from 1 to 15 ft. and seems to average about 8 ft. It is in contact with much stained clays but, so far as seen, not with hard rock. This sheet extends along 150 ft. of the crest of the ridge, which is copped by clays showing manganese float. At the same elevation on the north slope, the top of the sheet is again seen and numerous cuts on the hillside have a body of manganese oxide 8 to 10 ft. thick extending down the slope with an apparent easterly dip. This distribution suggests that the manganese

oxide passes as a connected sheet through the hill. The stream to the north shows some manganese oxide boulders, but no ore in place. The rock along this stream, which should lie below the manganese zone, if that is bedded, is a somewhat metamorphosed sandy shale, with poor bedding. The stream runs down the dip, and so gives practically no idea of the stratigraphic section.

In the Diablo River, within 200 ft. of the mouth of the creek, is exposed the same thin-bedded siliceous limestone seen on the Boqueron. The beds here strike about N. 70 deg. E. and are almost vertical. In the gullies and on the hillside of the creek deposits are visible, with boulders and fragments of this siliceous limestone, which also occurs in boulders up the east fork. None of this material was seen on the north and west sides of the manganese zone. On Diablo River, just below the mouth of the creek and on the north side of the creek near the mouth, are exposures of a much weathered rock, seemingly a breccia, in which no trace of bedding was observed. See map of mine No. 2, near Boqueron River, Panama, showing zone of manganese ore (outcrop and float).

The exposures of rock and manganese ore are poor and good bedding is lacking, so that it is impossible to make a definite statement as to the underground relations. The upward and eastward succession, suggested by the available data, consists of sandy shale, breccia, shale with thin bands of siliceous limestone, and finally the main body of hard gray thin bedded siliceous limestone. The manganese is segregated in a zone in the breccia which, near the mouth of the creek, stands on edge and farther up stream dips southeast and east. The ore is a secondary deposit formed by concentration in the residual clays weathered from the breccia, possibly being carried in from its original position because the breccia furnished a channel for the ready circulation of waters.

This explanation is suggested by the distribution of the rock fragments and exposures in relation to the few dips seen, and by the shape of the ore zone, which is narrow near the area of vertical dip in the siliceous limestone and wider where the dips would indicate a flatter deposit. These features suggest the possibility that the ore body continues to some depth at the mouth of the creek, but the question could be determined definitely by further excavation.

The ore now in sight, in boulders and in cuts on the two sides of the hill, can reasonably be estimated at 15,000 tons. Most of the ore is good, clean material, and would need little sorting. It differs somewhat from that at mine No. 1; it is a little softer and has more of a bluish tint. An assay of some of the ore has given the following result:

Assay of Ore from Mine No. 2 Near Boqueron River

	Per Cent
Total manganese	55.3
Sulphur	0.01
Phosphorus	0.07
Manganese dioxide	84.00
Manganese monoxide	2.86
Ferric oxide	0.47
Aluminum oxide	0.51
Calcium oxide	0.54
Magnesium oxide	0.12
Silica	7.58
Sulphur	0.08
Phosphorus pentoxide	0.16
Copper oxide	0.88

The two manganese-bearing deposits described here are on the west side of the Boqueron River, in the Republic of Panama and about 20 miles from Colon. This mineral was first observed by an Indian rubber cutter and pointed out to Jesse M. Hyatt of Colon, who recently died in New York. Mr. Hyatt claimed 800 hectares as a mineral zone.

The southern deposit known as mine No. 1 lies near a creek about three-quarters of a mile from the Boqueron River. The other deposit known as mine No. 2 is about four miles distant, on a small branch of the Diablo River, and about 800 ft. from the Boqueron River.

In November, 1916, the writer visited these deposits in company with Mr. Hyatt. The trip was made by train to Gamboa and by gasoline launch to Gatuncillo; and from the latter by cayuca (native dugouts), for two days up the Chagres, Pequeni, and Boqueron rivers to the first mine, or manganese deposit.

Geography of the Region

The country near the mines is very hilly, with the highest altitude of about 1000 ft. The hills are heavily wooded and carry a dense underbush. There are no traces of man except an occasional rubber cutter's trail and the remains of the centuries-old Spanish paved highway, or Camino del Real (Royal Road), which once extended from Porto Bello to Old Panama. Between the mines and the Caribbean Coast is a range of mountains (Serrano del Darién), the highest point of which in this district is La Bruja (The Witch) with an elevation of 3300 ft.; but in this range there is one gap with an altitude of less than 900 ft., through which the railroad passes to Nombre de Dios.

The Boqueron River has an altitude of about 300 ft. at the mouth of the Peluca River and about 500 ft. at the Diablo (Devil River). Downstream from manganese mine No. 1 there are several high falls, which prevent cayucas or periguas (round bottom dugouts as distinct from cayucas which have a keel. The periguas are used to run the rapids as the round bottoms slide over the water-worn boulders), passing between mines No. 1 and No. 2.

In the short dry season these rivers diminish notably, and the smaller streams disappear; in the longer wet season, during which the precipitation is between 80 to 120 in. between June and December, the rivers are full and the run-off is rapid.

The passage on the rivers in small cayucas is too slow and difficult to make feasible the shipping of large quantities of manganese ore to the Panama railroad crossing the Isthmus of Panama, but this problem has been solved by the construction of a tram line from the Boqueron mines to the Atlantic Coast. At Nombre de Dios (Name of God) this line passes through the gap in the mountains mentioned, and is 11 miles long, narrow gage, with Decauville dump cars and a 30-lb. rail. The road is now completed and in operation, costing about $125,000 in American money.

Topography of the Region

The general topographical features of the Darien region of which these manganese deposits form a part, are a succession of valleys lying between short steep ridges of slight elevation, from the Atlantic Ocean, 20 miles away, and Pacific Ocean inland; the two districts of this region ascend gradually to the Serrano del Darien mountains, separating Panama and Colombia.

The rock outcroppings show upper cretaceous and lower tertiary periods, with some Devonian rocks showing. The upper blankets are of standstone. Shales of various colors, limestone, marls and clays, with beds of fossils showing marine growth in both districts and plentiful.

Panama has 480 rivers, 300 of them emptying into the Pacific Ocean and 180 into the Atlantic Ocean. The Darien region has more rivers than any similar area in the world, and has wonderful undeveloped water transportation facilities, a stable government and decent oil and mining laws.

Geology of the Region

West of the Chagres River, in the Canal Zone, there is an area of the "igneous complex," which doubtless constitute the backbone of the mountain ridge that forms the divide between the Chagres River system and the Caribbean Sea.

Along the Chagres, almost as far upstream as the mouth of the Pequeni, the country rock is excellently exposed in many cliffs. The rock thus exposed has been mapped by Dr. D. F. MacDonald, of the U. S. Geological Survey in 1915, as the Emperador limestone.

The beds dip 5 deg. to 10 deg. to the south and southwest so that the traveler upstream is passing downward in the section. For several miles along the Chagres River the rocks appear to be sandstone, at some places shales, at other places coarse grained and much cross-bedded.

Near the base of these rivers is a zone of con-

glomerate. Farther up stream and undoubtedly below the sandy formation, there are beds of white and gray limestone containing shells and coral (showing former marine deposits) and fossilized shells.

Near the mouth of the Pequeni there are no cliffs; the river is flanked by a wide valley, presumably of shale, although only two small exposures were seen. The writer believes that these three formations represent Caimito formation (sandstone and limy conglomerate), the Emperador limestone (marine limestone with many corals) and the Cucaracha formation (land-formed clay rocks, lava flows, etc.), all of the Oligocene age.

In the Boqueron River below Mine No. 1, a hard pure-grained gray rock with no trace of bedding, forms many shoals and rapids. This is the prevailing rock in the vicinity of the mines, though it is not seen in contact with the manganese ore. The character could not be determined with a hand lens, but it is apparently a sedimentary moss containing much siliceous cement; near the head of the stream is a dark fine-grained Ingeceous Rock, probably Basalt.

For a mile below the mouth of the Diablo river the rock exposed along the Boqueron is a thin, hard-bedded, gray siliceous limestone, very unlike the Emperador limestone of the Chagres river district.

At most places where observations were taken the beds of this rock stand almost on edge, and at one place in the bed of the river a fault was seen.

This formation is found also on Diablo river near a manganese deposit associated with the ore bodies, though not in direct contact with them, are shales and breccia which are described in map No. 2, showing these manganese deposits as mine No. 2.

Costa Rican and Panama Manganese Compared

The Costa Rican deposits of manganese thus far discovered are all on the Nicoya Peninsula, in the Province of Guanacaste, on the Pacific Coast. The deposits are widespread, but most of them are rather low grade, or of small extent. The only deposits from which ore was being shipped in the last five years were the "Playa Real," "Curiol" and "Lagaste." Of these the first two are the only important producers.

The Playa Real manganese deposits were originally controlled by the Costa Rican Manganese & Mining Co., but have since been absorbed by the American Manganese Mfg. Co. of Philadelphia, a Keith company. The Playa Real and Curiol contain 10,000 and 15,000 tons approximately. The Berkshell Iron Works of Sheridan, Pa., showed an analysis on this deposit as follows:

	Per Cent
Metallic iron	1.22
Silica	1.70
Manganese	51.38

Tests were made on 12-ton lots and the Pavones proved to be a small deposit. These ores consist of oxide of manganese. Many Costa Rican deposits are as low as 25 per cent metallic manganese and as high as 8.75 silica, and show poorly in comparison with the manganese of Panama.

Magnetic Iron Ore in Panama

While prospecting for gold and copper in the provinces of Chiriqui and Veraguas in 1909-1914 I located a large body of magnetic iron ore in the foothills of the Chorcha mountains. From stripping calculations, I judged this deposit to be of high-grade iron ore and to reveal from surface level to upper outcroppings approximately 300,000 tons, but as we sank no shafts nor did any drilling I cannot state with any degree of accuracy as to what tonnage this deposit will carry. But from the numerous outcrops of high-grade ore, the tonnage will easily run into eight or nine figures, and merits the attention of Americans who are interested in cheap production of high-grade iron ore in an accessible location and close to water transportation.

Progress in Safety to Be Reviewed at Congress in Louisville

What has happened in safety during the past year will be the keynote of the Thirteenth Annual Safety Congress of the National Safety Council which meets in Louisville, Sept. 29 to Oct. 3.

The story of progress will be related by speakers of national and international prominence, will be shown vividly by exhibits, motion picture films and lantern slides and will be demonstrated in the daily sectional sessions and general sessions. More than 4000 industrial plants and community safety councils in 60 American cities, members of the National Safety Council, will be represented.

It is planned to have Secretary of Commerce Herbert Hoover and Secretary of Labor James J. Davis speak at the congress. The list of 275 speakers includes Richard F. Grand, president, Chamber of Commerce of the United States, Washington; Dr. Arnold J. Jacoby, director, psychiatric clinic, Detroit, and C. F. Kettering, vice-president and chief engineer, General Motors Research Corporation, Dayton.

New Morgan Continuous Sheet Bar and Billet Mills at Youngstown

The Morgan Construction Co., Worcester, Mass., has received a contract from the Youngstown Sheet & Tube Co., Youngstown, Ohio, for a continuous sheet bar and a continuous billet mill, which will replace continuous mills installed by the Morgan company in 1905 and in operation ever since. Each of the present mills has a capacity of 120 tons per hour. The two new mills will each produce at the rate of 200 tons an hour. The Youngstown Sheet & Tube Co. is replacing the older mills primarily for the purpose of improving the quality and cost of their product. The possibility, however, of securing a larger output of sheet bars and billets in times of heavy demand is, of course, one of the factors considered.

The greater production is made possible by the use of the new high-speed Edwards flying shear, which is a radical improvement over the Morgan company's older model flying shears. The present mills at Youngstown have a rolling speed of about 460 ft. per min. The new mills will have a delivery speed of 750 ft. per min.

The sheet bar mill installed in 1905 was the first continuous mill of its kind built by the Morgan Construction Co.; in fact, it was the first continuous sheet bar mill to operate anywhere. Since it was started up 20 Morgan continuous sheet bar mills have been installed in the United States and Europe, and a very large percentage of the sheet bar requirements is now rolled on these mills.

Graphite in 1923

The graphite mining industry in the United States made considerable progress in 1923, according to a report prepared by the U. S. Geological Survey, in cooperation with the geological surveys of Alabama, Michigan and New York. During the World War this industry flourished, for graphite is an essential war mineral, and large stocks of it, both domestic and foreign, were accumulated. Consequently in the years immediately after the war the industry languished. In 1923, however, there was an increase in the quantity sold and imported, as well as in value, the sales amounting to 4056 tons of amorphous graphite and 3,964,900 lb. of crystalline graphite, compared with 2200 tons of amorphous graphite and 1,849,766 lb. of crystalline graphite in 1922. The manufacture of artificial graphite at Niagara Falls, N. Y., reached the high mark of 26,761,015 lb., more than twice the output there in 1922. The quantity of graphite imported for consumption rose from 12,488 net tons in 1922 to 19,434 tons in 1923, an increase of 56 per cent.

PREDICTS GREATER PROSPERITY

Washington View as to Effect of Dawes Plan—Sudden Change Not Expected

WASHINGTON, Aug. 18.—A special number of *Commerce Reports*, dealing with the economic consequences of the acceptance of the Dawes plan for the settlement of the reparations problem, has just been issued, marking the inauguration of a new editorial policy for the weekly organ of the Bureau of Foreign and Domestic Commerce, which hereafter will issue a special number whenever an economic or political event of first importance affecting economic international relations takes place. The present issue says in part:

"The adoption of the Dawes report by the London conference has meant the conclusion of perhaps the greatest effort since the war to bring about financial stabilization in Germany and economic reorganization in Europe as a whole.

"The stabilization of the European economic situation will result in a revival in world trade, in which our country is bound to have its share. According to most recent estimates, the actual quantity of merchandise now entering into international trade is around only 80 per cent of pre-war figures. This slowness of business conditions which has persisted five years after the conclusion of the war is chiefly caused by the lowered standards of production and consumption over a large part of eastern and central Europe—an economic derangement which has been awaiting a settlement of political problems. Naturally, European business stability will have as a result increased exports of European goods. This will bring with it sharper competition in outlying markets but at the same time a raising of the consuming power of the entire world, particularly the disturbed areas of Europe, and the increased demand for goods will cause a general rise in the standard of living all over the world.

"Naturally, changes can not occur overnight and it will take time for the situation to readjust itself. It must also be assumed that economic developments are allowed to progress without political or other interference. In the long run, however, economic stability in Europe brings with it enlargement of world prosperity and a rise in living standards in all countries. It means, furthermore, the restoration of a market upon which millions of our producers depend."

Effect on Iron and Steel Industry

Luther Becker, chief of the Iron-Steel-Hardware Division of the Bureau of Foreign and Domestic Commerce, comments at some length upon European stabilization and the iron and steel industry. He says in part:

"The adoption of the Dawes plan will have an invigorating effect upon the international iron and steel industry. The good results may not be immediately visible in the shape of increased world production of iron and steel, but enhanced German and European purchasing power is bound to result in increasing demands for products of these commodities.

"An attempt to forecast as to what countries will more greatly benefit by the increased world demand is difficult. Adjustments may be influenced by political rather than economic issues, or, more likely, by both with either in a subordinate position. However, certain facts are known from which the reader may draw his own conclusions.

"An analysis of 5,000,000 tons of Germany's iron and steel exports in 1913 shows that 3,750,000 tons went to European countries, including Great Britain; 650,000 tons to British India, Australia, and the Far East; and 400,000 tons to South American countries.

"With a stabilized situation in Europe and international credit and confidence restored, world purchasing power will be enhanced. European countries will demand larger quantities of raw materials from all parts of the world, supplying those sections with the funds for the purchase of finished materials and a further development of their natural resources."

ALABAMA PIPE CO. FORMED

Consolidation of Numerous Plants in Alabama Valued at $5,000,000

BIRMINGHAM, ALA., Aug. 19.—One of the largest mergers or consolidations announced in a long while is that of the Alabama Pipe Co., headquarters in Anniston, Ala., which has acquired 14 soil pipe plants and a water pipe shop, properties valued at about $5,000,000. The officers, directors and stockholders in the company include Thomas E. Kilby, former governor of Alabama, chairman of board; C. A. Hamilton, W. F. Johnston, Whitfield Clark, Anniston; William Byrd, Chicago, formerly with the Hammond-Byrd Iron Co. Announcement was made during the past week that Otto Agricola had sold to the promoters of the merger his pipe shop at Gadsden, while the Hammond-Byrd Iron Co. interests disposed of their Coosa Pipe & Foundry Co., Gadsden; Gadsden Pipe Co., Gadsden; Talladega Pipe Co., two plants, and the Imperial Pipe Co., Bessemer, Ala. The following are included in the holdings of the Alabama Pipe Co.:

Coosa Pipe & Foundry Co., Gadsden; Gadsden Pipe Co., Gadsden; Agricola Pipe Co., Gadsden; Talladega Pipe Co., Talladega, two plants; Imperial Pipe Co., Bessemer; Superior Pipe Co., Bessemer; Ornamental Foundry Co., Anniston; Standard Foundry Co., Anniston, including a water pipe plant; Alabama Pipe & Foundry Co., Anniston; Union Foundry Co., Anniston; and the recently purchased Rabe Pipe & Foundry Co., Chattanooga, Tenn.

The New Selling Agency

Still another group of soil pipe plants, which have individual ownership, is represented by the Gulf States Pipe Corporation, recently organized. It is a selling agency of the several plants affiliated. This list includes the Emory Foundry Co., Anniston; Independent Soil Pipe Co., Anniston; Southern Pipe & Foundry Co., Knoxville, Tenn.; Kilby Pipe Co., Birmingham; Rudisill Soil Pipe Co., Anniston; Southern Pipe & Foundry Co., Birmingham; Interstate Foundry Co., Anniston.

There are yet a number of independent soil pipe plants in Alabama and the South doing business, among others the following: Central Foundry Co., three plants in Alabama; Birmingham Machine & Foundry Co., two plants; Cox Foundry Co., Bessemer; Davis Pipe & Fittings Co., Birmingham; Sanitary Fittings Co., Birmingham; Bessemer Soil Pipe Co., Bessemer; Anniston Foundry Co., Anniston; Anniston Soil Pipe Co.; Casey-Hedges Co., Chattanooga, Tenn.; Somerville Iron Works Co., Chattanooga; National Pipe & Foundry Co., Attalla, Ala.; Charlotte Pipe & Foundry Co., Charlotte, N. C.; Iron City Pipe & Foundry Co., Birmingham.

It is understood that the Alabama Pipe Co. is being formed without any financial assistance from the outside and no bonds will be sold. In other words, it will be an Alabama concern with Alabama capital.

New Mills of Bethlehem Steel Co.

The Bethlehem Steel Co. is going ahead with its betterment program at its Lackawanna works, having just distributed orders for a complete 28-in. structural mill and a 35-in. roughing mill. Morgan Engineering Co., Alliance, Ohio, will furnish the 28-in. mill complete and the front and back tables for the 35-in. mill, which is to be built by the Mesta Machine Co. It is expected that the company will take action shortly on 15 cranes for Lackawanna works and the 17 cranes on which bids have been asked for installation at Cambria works, Johnstown, Pa.

The company has placed the principal equipment for the new power house at Johnstown, Pa. The General Electric Co. will furnish a 15,000-kw. turbo-alternator unit and the Pittsburgh Transformer Co. six 8000-kva. transformers. This is preliminary to an elaborate mill electrification program.

NEW TOOL STEEL MATERIAL

Great Density and Endurance Obtained by Dycast Process for Forging Dies and High-Speed Steel Tools

Using a combination of metallurgy and organic chemistry, the nature of which cannot be disclosed until patent applications now in the United States Patent Office are granted, the Dycast Steel Co., Collinsville, Conn., has produced a new crucible tool steel of exceptional density and wearing qualities. The final molecular characteristics of the metal made by this process are obtained in the crucible during melting, rather than under the hammer or press, for the material as cast, after being finished by a light grinding operation and heat treated, is put immediately into use without forging or rolling. The process employed gives not only an exceptional density but great homogeneity, because the reaction provided disposes of the gases and oxides commonly encountered in ingots cast in the usual manner as a prelude to forging and, since the process corrects the metal mechanically, there is no physical disturbance of the structure.

On removing the crucible from the melting chamber, the metal is unusually quiet in spite of an exceptionally high temperature. And in spite of this elevated temperature the metal, after pouring, shows no signs of burning and remains where it is placed in the mold, without the ebullition usually observed in the pouring of steel. It becomes plastic almost at once and retains this plasticity for a considerable time before going suddenly into the solid state. This is in contrast with the usual action by which steel goes, on practically a "straight line," from the extreme fluid state through a state of varying plasticity into the solid state.

Freedom from Ingotism

Its density of structure, which is of value not only with regard to its cutting edge, but in holding that edge long beyond the usual limit, is due not only to the elimination of the impurities usually found under the surface of steel ingots, but also to the sudden and rapid solidification from the plastic state. During this relatively prolonged period of plasticity an internal radiation appears to reheat the outer surfaces of the metal, thus avoiding the "ingotism" existing in the regular steel melting processes, and also avoids the skin formed otherwise upon contact with the relatively cool surfaces of the mold, thus avoiding porosity. With steel so thoroughly killed and mechanically corrected, a material results which is exceedingly dense and free from non-metallic substances.

Improvement in these characteristics is partially due to the severe ebullition set up by the reaction of the organic matter placed in the crucible shortly before the metal is ready for pouring. This causes matter not in actual solution to be driven to the surface and thence into the slag. This holds true for everything which is not iron and which is not reduced and thoroughly deoxidized. If the tungsten, for instance, is not properly in solution, that portion, whether in the form of solid or tungstic oxide, will be driven out of the bath and into the slag. Chromium oxide will be treated in a similar manner. Hence the melter knows that as soon as ebullition ceases the metal may be poured.

As the metal is thus controlled in a mechanical manner, there cannot be any movement after it has been poured in the mold. This control accounts for its observed quietness, both in the crucible during pouring and in the mold after pouring. This is in contrast with the usual wildness of steel when poured into a cold iron mold, due to the great variation in temperature between mold and steel, which causes the porosity to form immediately under the skin, created by a combination of vaporization, oxides and mechanical reaction.

Dies Tested in Service

In a test of dies made by this method, used in the production of ball-bearing race rings by a Connecticut manufacturer, the first cost of the Dycast die was given as $24, against a cost of $20 for the competing die of high-speed steel. The latter figure included $16 for the die, plus $4 for the machine work on it. Machine work is a minimum on the Dycast die, as the die is cast very close to its ultimate form, with merely a thin layer of material to be removed. This avoids waste of high-priced material, in addition to the hours of machine work necessary on a highly resistant metal.

In the test, as carried out, the Dycast dies made about 15,000 impressions before it was necessary to redress, and as high as 32,000 impressions before it was necessary to discard the die for a new one, although the life of the die is figured as an average of 25,000 impressions. In the other dies, made of forged high-speed steel, redressings were necessary on the average after 1500 impressions, or only one-tenth as many as the Dycast dies stood before redressing. The other dies had a useful life of only 7000 impressions, or about one-fourth the life of the Dycast die.

More Useful Hours Per Day

Aside entirely from the cost of the die per 1000 impressions, which was less than $1 in the case of the Dycast and about $3 for its competitor, the question of useful working time of the press becomes important. Due to redressing or changing dies, the average delay to the press in the case of the Dycast dies figured out at about 15 min. per day, giving 8¾ hr. of useful time in a 9-hr. day. The dressing time for the other dies occupied about 3½ hr. per day, reducing the useful operating time to 5½ hr.

In addition to this, it is possible to run the Dycast die, particularly when it has the tough back made possible by another special process, at a rate perhaps 20 per cent faster than is safe with the usual high-speed steel. This increased production is a large element in the cost per unit of the material turned out.

Quite 70 per cent of the failures of hot heading dies are due to breakages caused by accidents, mechanical and human faults. In a period of three months it was observed that the slipping of the stop gage, permitting too great a length to enter the die, caused 18 per cent of the total destruction and too sudden and heavy pressure against the stop gage by the operator (usually inexperienced) caused 16 per cent destruction; 11 per cent of the breakages were caused by irregularities set up at heat treatment and 25 per cent were due directly to laminations and elongated internal strains set up during forging from the ingot to the finished bar. It is thus obvious that a die having a structure free from laminations and physical irregularities and containing contituents giving real red hardness will not "wash" or check and, since it is reinforced with a backing of the toughest iron produced, it must be practically unbreakable.

The one hundredth anniversary of the founding of the firm of B. F. Avery & Sons, farm implement manufacturers, Louisville, Ky., was celebrated July 21-25, with a convention of dealers from all over the United States and foreign countries. The company provided extensive entertainment features, the arrangements for which were in charge of Donald McDonald, vice-president.

A transparent damp proofing, known as "Super Por-Seal," and intended as a surface application over concrete, stucco, brick and masonry, has been placed on the market by the Truscon Laboratories, Detroit. Its general composition is much the same as the Truscon waterproofing paste, except that it is in a clear solution.

A conference of Eastern sales managers of builders of machine tools is called for 9 a. m., Tuesday, Sept. 17, in the lecture room of the Mason Laboratory, Yale University, New Haven, in connection with the machine tools meeting and exhibition to be held that week at Yale University.

INCREASING PRODUCTION

More Activity of Finishing Mills in the Youngstown District

YOUNGSTOWN, Aug. 19.—District iron and steel properties are still maintaining substantial schedules, approximating normal in finishing departments with some of the larger interests. There has been a satisfactory inflow of new business, which is reflected in the expanding production.

For instance, 82 sheet mills were scheduled Monday for rolling in the Mahoning Valley, six more than the previous week, and the best production record in several months.

The Youngstown Sheet & Tube Co. has added "B" blast furnace in its East Youngstown group to its list of active furnaces, giving the district 17 active stacks, of 45. The active furnaces produce in excess of 40 per cent of the district capacity, as the larger type stacks are active. The company is now operating four of the nine blast furnaces in its Eastern division, including three stacks in the East Youngstown complement and one at the Brier Hill works.

With the independents, steel making embraces 32 of 52 open-hearth furnaces, while 23 of the 30 open-hearth furnaces of Steel Corporation subsidiaries are melting. Three Bessemer plants are in commission in the district, one of the Sheet & Tube company, one of the Carnegie Steel Co. at the Ohio Works, at 80 per cent, and another of the Carnegie company at New Castle, Pa., at 75 per cent.

At the Ohio Works of the Carnegie company, two of six blast furnaces are pouring, while all 15 open-hearths are scheduled. Pig iron is being shipped to the Ohio Works plant from other Carnegie properties. Two blast furnaces of the Carnegie company are operating at New Castle, Pa.

In this district, finishing mill production of the leading interest is well sustained, bar mills operating at 80 per cent, sheet mills at 75 per cent and tin mills at 60 per cent.

The Waddell Steel Co., at Niles, resumed this week with four sheet mills, following a suspension of several weeks. The Mahoning Valley Steel Co. is operating its full complement of eight sheet mills at Niles. Other non-integrated rolling interests are maintaining output at 75 per cent or better.

The Sheet & Tube company is operating this week at 70 per cent in the Youngstown district; the Republic Iron & Steel Co. at 55 per cent; the Trumbull Steel Co. at 80 per cent; Sharon Steel Hoop Co. at 95 per cent, and the A. M. Byers Co. at 85 per cent.

A 6-Ton Induction Furnace at Allegheny Steel Co.

A 6-ton horizontal ring-type induction steel melting furnace, the largest of its kind in this country, has recently been placed in successful operation by the General Electric Co. at the plant of the Allegheny Steel Co., Brackenridge, Pa. This unit operates on the principle of a transformer, the secondary circuit of which is the metallic bath or furnace charge.

The furnace is rated 800 kw. at 2200 volts, single-phase, 8.5 cycles, with a hearth capacity of 12,000 lb. Suitable refractory lining material is provided in the form of "Furnite," a composition of calcined and electrically fused magnesia developed by the General Electric Co. The furnace has four doors, one of which is used exclusively in pouring and the other three for charging and inspection of the hearth. Conventional motor-driven tilting mechanism of the rocker type is provided.

Power is supplied at 25,000 volts, 60 cycles, 3-phase. This is first stepped down to 2200 volts and is then converted into 2200-volt, 8.5-cycle, single-phase power by means of a motor generator. A motor-driven blower supplies cooling air to the furnace winding.

The average time necessary for melting, refining and alloying a charge of 7000 lb. of steel scrap is four hours, with a total overall energy consumption of about 800 kw.hr. per ton. The furnace is operated by one melter and two helpers in 8-hr. shifts, the operation being continuous.

One of the desirable features claimed for this unit is a high grade product of extreme uniformity, resulting from the ease of metallurgical control and the cleansing and stirring action caused by the electromagnetic forces in the metal bath.

Ford Motor Co. Goes Into Coal Business

DETROIT, Aug. 18.—In line with its policy of rounding out its iron ore and other lake shipping interests, the Ford Motor Co. announces its entry into the coal business at the head of the lakes. The freighter Benson Ford docked Aug. 12 at Duluth with 12,000 tons of coal, which will be distributed over the Superior coal and dock property, recently leased by the Ford interests for one year. This will be shipped to the Ford plants at St. Paul, Minneapolis and other Northwestern points and sales offices for supplying other industrial concerns, the railroads and the public will shortly be opened at Duluth and St. Paul. The coal, which comes from the Ford mines in Kentucky, was loaded at Toledo, but eventually this will be handled over coal docks to be constructed at the Rouge plant in Detroit. The Ford boats will then maintain a regular schedule of coal north from Detroit to Duluth and of iron ore from the Ford mines south bound. The coal will be screened at Detroit and only the lump sizes sent up the lakes, the fine coal being used in the coke ovens at the Rouge. The northern end of the Detroit, Toledo & Ironton Railroad is to be shortened considerably in order to expedite the handling of coal into Detroit, and for this purpose a bond issue of $7,500,000 has been authorized.

The Benson Ford, recently completed at the Ecorse plant of the Great Lakes Engineering Works, is one of the largest carriers on the lakes and is unique in that it is equipped with Diesel engines. The initial trip was made without trouble. W. B. Mayo, chief engineer of the Ford Motor Co., was on board.

Bookings of Steel Castings in July

WASHINGTON, Aug. 19.—The Department of Commerce announces July bookings of steel castings, based on reports from principal manufacturers, representing over two-thirds of the commercial castings capacity of the United States, as 37,339 tons, as against 48,718 tons in June. The following table shows the bookings of commercial steel castings for the past 19 months by 70 identical companies, with a monthly capacity of 100,700 tons, of which 39,100 tons are usually devoted to railroad specialties and 61,600 tons to miscellaneous castings:

	Total		Railroad Specialties		Miscellaneous Castings	
Month 1923	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity
January ..	102,718	102.0	48,580	124.2	54,138	87.9
February ..	90,590	90.0	38,696	99.0	51,894	84.2
March	146,157	145.1	77,263	197.6	68,894	111.8
April	93,621	93.0	40,483	103.5	53,138	86.3
May	92,445	91.8	39,686	101.5	52,759	85.6
June	88,306	87.7	43,478	111.2	44,828	72.8
July*	54,316	53.9	17,390	44.5	36,926	59.9
August ...	52,805	52.4	19,103	48.9	33,702	54.7
September..	49,401	49.1	22,374	57.2	27,027	43.9
October ...	39,651	39.4	10,641	27.2	29,010	47.1
November..	42,008	41.7	13,645	34.9	28,363	46.0
December..	42,762	42.5	15,600	39.9	27,162	44.1
1924						
January ..	51,406	51.0	19,572	50.1	31,834	51.7
February ..	73,138	72.6	35,474	90.7	37,664	61.1
March	100,514	99.8	59,778	152.9	40,736	66.1
April** ...	67,806	67.3	33,151	84.9	34,655	56.2
May**	56,581	56.2	28,064	71.8	28,517	46.3
June	48,718	48.4	26,170	67.0	22,548	36.6
July	37,339	37.1	15,761	40.3	21,578	35.0

*Two companies with a capacity of 785 tons per month on miscellaneous castings now out of business.

**Reports missing from one small company on miscellaneous castings.

JAPAN INQUIRES FOR PIPE

Government Railroads to Buy Million Feet of Gas Tubes—American Imports of German Steel Expected

NEW YORK, Aug. 19.—Japanese trade continues in fair volume and would undoubtedly be even larger were it not for the weak market prevailing in Japan. The seriousness of this downward trend in prices resulted recently in the formation of an association of large bar sellers who maintain stocks in Japan. United in this temporary organization, the distributers of bars, threatened previously with the necessity of disposing of their stocks at a loss, have been able to obtain credit from banks, which individually many of them could not have secured, and although the association is less than a month old, there is said to have been a distinct stiffening in bar prices as a result of its efforts.

The Chinese market still is extremely quiet. The firm condition in the copper market has apparently caused Chinese consumers to refrain as far as possible from heavy purchasing at present. Wire shorts seem to be still unacceptable even at reduced offering prices. A few months ago the reverse of this situation prevailed. The movement in wire short prices was upward and few lots were being offered for Chinese consumption. The firm situation in the scrap market in the United States prevents offers of second-hand plates and other similar material at prices interesting to the Chinese distributer.

The outstanding inquiry from Japan, on which exporters have been submitting bids, is a large tonnage of gas pipe, inquired for by the Imperial Government Railways. The specifications call for 1,155,540 ft. of ⅜-in. and 1-in. black gas tube with British thread. This is the second gas pipe inquiry to appear from Japan in the past fortnight. The previous inquiry was for 275,000 ft. of gas tubes for the Nagoya Gas Co. Another current inquiry, which may be the forerunner of further purchasing from a source that has been inactive for several months, is for 1700 tons of sheet steel piling, which has been asked for by the Reconstruction Board.

Recent sales of tin plate to Japan, exclusive of the large lots placed by the Nippon Oil Co., probably total more than 10,000 boxes. One export house reports placing 2200 boxes of tin plate with an American mill for shipment to a Japanese brewery. The sheet market continues quiet in the face of firm prices quoted by the large export interests. Only occasionally is an exporter able to obtain a concession on a fairly large tonnage of light gage black sheets for Japan. The current schedule seems to be well maintained at $90 to $91 per ton, c.i.f.

The only recent inquiry for rails, except for the 25 miles of 60-lb. rails, for which the Chosen State Railways are in the market, is from Kanan Taishu Kumiai, Formosa. Bids will be opened Aug. 28 on 1000 tons of 60 to 80-lb. second-hand rails in 20 to 30-ft. lengths. Delivery of 500 tons by September is required. Sellers of relaying rails claim that these would not be suitable for relaying and are probably intended for reinforcing or some other purposes.

With a European settlement in prospect, exporters generally concede that German competition in foreign markets will be felt increasingly this fall. The American domestic market being less inclined to develop weakness, importers are beginning to reestablish relations with European mills. Recently one large French interest, out of the market for the past three or four months as far as export to the United Staes was concerned, has been offering to accept tonnage. In the meantime, it is reliably reported that the large German interest of August, Thyssen & Co. has established an agency in New York through its export subsidiary, and a company will shortly be formed to handle import business. It is understood that steel offered from this source will be rolled to American specifications and will be open hearth. A few importers are interesting themselves in foreign pig iron, but there seems to be little prospect of profitable importation of pig iron for some time.

GERMAN IRON AND STEEL TRADE

Exports and Imports Less Than Last Year—Machine-Tool Movement Far Below Pre-War

BERLIN, GERMANY, Aug. 2.—Imports of iron ore, which have constantly increased during the last few months, have again been higher during June, and advanced from 200,000 to about 240,000 tons. But during the first six months of this year the total imports amount to only 612,468 tons, compared with 1,548,883 tons during the same time in 1923.

Rolled material and iron goods imports increased from 61,075 to 109,513 tons, while exports, which during 1922 showed a monthly average of 193,097 tons, decreased from 86,418 to 84,409 tons. Machinery exports during June amounted to 20,374 tons, compared with 21,723 tons during May, and a monthly average of 39,895 tons during 1922. The June foreign trade in semi-finished material shows a decrease. The imports amounted to 6457 tons against 8822 tons during May, and exports to 444 and 527 tons respectively. Altogether, the foreign trade in iron and iron goods has been smaller than last year.

German foreign trade in iron and iron goods, in metric tons, has been:

	May, 1924	June, 1924	January, 1924-June, 1923	
Imports	101,661	148,917	660,604	927,056
Exports	118,303	107,260	748,488	969,291

Exportation of machine tools has been decreasing since February and the total for the first half of this year is less than 50 per cent of the 1913 exports during the same time. Altogether, it amounts to about 15 per cent of the entire machinery exports. Among the machine tools, those for the iron and engineering lines amount to about 80 per cent. The export (unit) value for machine tools is only 20 per cent above 1913 quotations, while textile machinery is much dearer. Importation of machine tools is only small in comparison with the exports, but it increased from 80 tons during January to 129 tons during July.

Exports in Metric Tons

	Machine Tools Total	Engineering Machine Tools	Wood-Working Machinery
January	3,652	2,761	828
February	3,778	2,907	809
March	3,696	3,056	573
April	3,650	2,872	660
May	3,481	2,588	783
June	3,354	2,416	824
6 Mo., 1924	21,611	16,600	4,477
1913	90,279	74,336	12,222
1922	78,167	59,725	15,449
1923	49,762	35,632	12,879

The members of the Electric Hoist Association report a decrease of 17.62 per cent in the number of hoists sold in July as compared with June, and a decrease of 9.43 per cent in the value of hoists ordered. Shipments in July increased 13.07 per cent as compared with shipments made in June.

Steel furniture shipments are reported by the Department of Commerce for July at $1,115,792, the smallest month's total since September, 1922. In June the figure was $1,270,615; all other months of 1924 showed more than $1,500,000 each. In July last year the total was $1,247,605, the smallest of that year.

The M. A. Hanna Co., Cleveland, has taken over the operation of the Homer iron mine of the Wickwire-Spencer Steel Corporation at Iron River, Mich. This mine was first opened in 1912 and has been shipping ore since 1915.

European Sentiment Measurably Better

Business Still Is Slack and Many Workers Are on Short Time—Pig Iron Being Stocked at French Furnaces

(*By Cable*)

LONDON, ENGLAND, Aug. 19.

PIG iron is dull and prices are unchanged. Cleveland plants are closed this week because of the Stockton holidays.

Foreign ore is quiet. Bilbao Rubio sellers have difficulty in obtaining 22s. ($4.95) c.i.f. Tees. North African ore is quoted at 20s. ($4.50) c.i.f. Tees.

Finished steel is dull on account of the holidays, but prices are firm because of heavy costs. In Sheffield 7000 men are out of work on account of a wage dispute.

Sheets and Tin Plate

Tin plate is in moderate demand in both domestic and export markets. Fair sales have been made up to 23s. ($5.17) basis IC, f.o.b. The price has been advanced officially and the minimum now is 23s. basis IC, f.o.b. Makers are perturbed at the likelihood of having to increase wages and high prices are asked.

Galvanized sheets are firm, with an upward tendency. Makers are well placed and moderate business in small parcels is passing. There are signs of an Indian demand developing.

Black sheets are steady on small sales for Japanese account.

On the European Continent

Continental position still is difficult, but a better tone is anticipated on account of the conclusion of the London pact. Buyers demand evidence that prices will not fall further before making forward commitments. There is fair inquiry from British consumers of semi-finished material.

In Luxemburg 34 blast furnaces out of 47 in existence are blowing, namely: 14 Arbed, 8 Hadir, 10 Terres Rouges and 2 Steinfort.

In Belgium 51 furnaces were blowing on Aug. 1.

In Germany the Bergbau Aktien Gesellschaft Lothringen intends to erect an iron and steel works at Blankenburg, in Brunswick, including ultimately four blast furnaces.

British Industry Looking Hopefully from the Slough of Despond

LONDON, ENGLAND, Aug. 7.—More or less stagnant conditions continue to rule in the iron and steel markets here and the position has been accentuated by the holiday period just past, but with the political situation here and on the Continent taking a more favorable turn, sentiment has veered around somewhat and an improvement in trade in the near future is being counted upon. It is difficult to see how the British iron and steel industries can reap any benefit from the settlement of the reparations question, but undoubtedly the feeling that this all-important problem is possibly on the point of settlement has accounted for the better tone generally.

So far as iron and steel in particular are concerned the actual position is no brighter. Buying on the part of home consumers represents no more than the covering of bare necessities, while export demand is equally poor. Ironmasters have tried to meet the situation by successive reductions in prices and, though Cleveland No. 3 can now be obtained freely at £4 5s., buyers are not tempted. Foreign iron, it is true, has been offering on very favorable terms, but even this material is not meeting with much response from consumers in this country. Hematite, too, has naturally shared in the dullness and prices have weakened further, East Coast mixed numbers having been named at £4 14s.

The position in the finished iron and steel branches is without alteration. Here, too, demand is limited, especially so far as heavy gages are concerned, but a

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British and Continental prices per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.50 per £1, as follows:

Durham coke, del'd	£1	6s.	to	£1	6½s.	$5.85	to	$5.96
Bilbao Rubio ore†	1	4				5.40		
Cleveland No. 1 fdy	4	10				20.25		
Cleveland No. 3 fdy	4	5				19.12		
Cleveland No. 4 fdy	4	4				18.90		
Cleveland No. 4 forge	4	3				18.67		
Cleveland basic	4	2½				18.56		
East Coast mixed	4	13				20.92		
East Coast hematite	4	19	to	5	0	22.27	to	22.50
Ferromanganese	13	10	and	16	0*	60.75	and	72.00*
Rails, 60 lb. and up	8	5	to	9	0	37.12	to	40.50
Billets	7	15	to	8	5	34.87	to	37.12
Sheet and tin plate bars, Welsh	8	12½				38.81		
Tin plates, base box	1	2⅜	to	1	3	5.03	to	5.17
						C. per Lb.		
Ship plates	9	5	to	9	15	1.86	to	1.96
Boiler plates	13	0	to	13	10	2.61	to	2.71
Tees	9	7½	to	9	17½	1.88	to	1.98
Channels	8	12½	to	9	2½	1.73	to	1.83
Beams	8	7½	to	8	17½	1.68	to	1.78
Round bars, ¾ to 3 in.	9	12½	to	10	2½	1.93	to	2.03
Galv. sheets, 24 g	18	5	to	18	10	3.67	to	3.72
Black sheets, 24 gage	13	0	to	13	5	2.61	to	2.66
Black sheets, Japanese specifications	15	5				3.06		
Steel hoops	10	15	and	12	10*	2.16	and	2.51*
Cold rolled steel strip, 20 gage	17	0				3.41		

*Export price, nominal for ferromanganese.
†Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(*Pig iron, billets and angles are nominal*)

Foundry pig iron:								
Belgium	£3	18s.	to	£4	0s.	$17.55	to	$18.00
France	3	18	to	4	0	17.55	to	18.00
Luxemburg	3	18	to	4	0	17.55	to	18.00
Billets:								
Belgium	5	12½				25.31		
France	5	12½				25.31		
Merchant bars:						C. per Lb.		
Belgium	6	2½				1.23		
Luxemburg	6	2½				1.23		
France	6	2½				1.23		
Joists (beams):								
Belgium	6	0				1.21		
Luxemburg	6	0				1.21		
France	6	0				1.21		
Angles:								
Belgium	8	0	to	8	5	1.61	to	1.66
⅛-in. plates:								
Belgium	7	10				1.51		
Germany	7	10				1.51		
¼-in. plates:								
Luxemburg	7	10				1.51		
Belgium	7	10				1.51		

brisk business is still moving in lightweight material, such as sheets, bolts, nuts and so forth. Prices, however, are practically stationary, makers asserting that further concessions are absolutely out of the question, having already discounted the fall in pig iron and in fuel.

It is stated that the Monmouthshire Shipbuilding Co. yard at Chepstow, which the Government used during the war for merchant marine purposes, has been acquired by a large shipbuilding and engineering company, the name of which has not yet been disclosed. It is stated that operations are to commence almost immediately on the building of ships.

Negotiations for the reorganization of Bolckow, Vaughan & Co., Ltd., iron and steel manufacturers of Middlesbrough, are making definite progress, which will involve writing down of capital and the appointment of a managing director. It is also understood that negotiations have been initiated with the Cargo Fleet Iron Co., and another Tyneside concern.

SCRAMBLING FOR BUSINESS

Crisis Continues in German Iron Industry—Heavy Fluctuation in Prices—Many Short-Time Workers

BERLIN, GERMANY, Aug. 2.—The German industrial depression is at present not so much apparent in the number of unemployed as in the large number of short time workers. In the Rhenish-Westphalian coal industry for instance a large number of mines close a day now and then in order to decrease production, a measure which affects about 30,000 miners every day. Many firms in other lines are introducing longer holidays. Manufacturers hope that business will revive after a satisfactory settlement at London. The reduction which has generally taken place in the rate of capital interest and the slightly greater liquidity in the money market are noticeable improvements. After the harvest, which promises to be a good one, a greater demand is expected from the agricultural side, though it seems that the crisis generally has not reached the summit. The slackness in the iron and engineering industry is still very acute, though a few more orders have been booked recently. Generally the works have employment for about three weeks. Prices vary greatly and on account of the uncertainty of the development in the immediate future, the mills are careful in accepting orders in spite of the need for them to keep the works going.

In the iron industry negotiations for the formation of a cartel of the heavy sheet producers had been successful and an agreement had been drawn up for the fixing of contingents of production for the different works, while selling and fixing of prices were to be left to the manufacturers. At the last moment the Mannesmann works declined to become a member until the coal syndicate is reestablished in its old form. This action may be regarded as a move to bring pressure to bear upon the large outsiders, Thyssen, Rheinstahl, Rheinstahl-Arenberg, etc., which also are largely interested in the establishment of a cartel or syndicate in rolled material, especially the heavy sheet line, to fall in with the view of the minority in the coal syndicate. The reestablishment of syndicates in the iron industry is undoubtedly premature and will hardly be a success so long as the present industrial crisis continues.

Keen Competition for the Little Business to Be Had

Conditions in the iron market show few changes during July Hopes of improvement, entertained on account of reduction in coal prices, have not materialized. The market is unsettled, though works' prices lately have been more steady. The crisis has extended further into the engineering line and firms have been forced to reduce production and dismiss some of their men or introduce short time. With decreasing employment competition in the engineering industry has become more keen. The scarcity of credit and of liquid money and the high rate of bank interest still are hampering business. In the Rhenish-Westphalian industry there are no signs of improvement. Business is slack in all lines, but the iron industry especially is affected. More firms are forced to decrease production and the crisis is becoming more acute every week.

Traders and smaller firms, which have to dispose of part of their stocks to get ready cash, are at times selling at below cost and bar iron is sold as low as 105 marks per ton (1.13c. per lb.). Firms with larger financial reserves, however, are not dumping their goods, but the prices obtainable generally leave only a small margin of profit. Many works have reduced their pig iron and steel production by nearly 30 per cent and negotiations have been conducted with a view to devise a plan for a general systematic reduction of output, but without definite results.

Such a plan could be put into operation only by general agreement and, judging by the failure of the recent negotiations in regard to the syndicate, prospects for a regulation of output are small. Future development of the iron industry depends partly on the outcome of the present international negotiations, but an improvement in the inland market is impossible before the general financial calamity is removed. Coal prices can hardly be expected to come down for some time and other costs are still too high to make a further reduction in iron prices possible. The few export orders which are booked are too small to make up for the slackness in home business.

Pig Iron Dearer Than Scrap

Pig iron has remained fairly steady lately and is comparatively dear in relation to scrap. Demand is slack but, on account of the uncertainty in regard to the development of the market in the near future, the last meeting of the Pig Iron Association decided not to alter prices at present. The scrap market also is dominated by an acute slackness. On account of the depression in the iron market the iron works show only a small demand and prices are below pre-war quotations. There is strong competition but it is hardly possible that prices will come down further; they seem to have reached the lowest mark. The financial stringency is making itself especially felt in the scrap trade, as the wholesalers have to pay in cash while the iron works demand extensive credits. At present prices range at about 48 marks ($11.62) for cast iron scrap, at 42 marks ($10.16) for solid scrap, at 44 marks ($10.65) for steel and 32 marks ($7.75) for turnings.

Prices for semi-finished material have changed little lately. Business in tin plate is quiet. Demand is small as the tin goods manufacturers have few orders. Trade in medium sheets also is slack. Prices have been maintained, however, and official works base prices are at between 165 and 170 gold marks per ton (1.78c. and 1.84c. per lb) for thin sheets of 1 to 3 mm. (No. 19½ to 11½ gage) thickness, and 175 to 180 marks (1.89c. to 1.95c.) for plate below 1 mm. Demand in heavy sheets has decreased and the mills are insufficiently employed in this line. Prices are between 130 and 140 marks per ton (1.40c. and 1.51c.). Some traders, however, are in the market with cheap lots and are undercutting even works' prices, and heavy sheets may be procured at 115 to 120 marks per ton (1.24c. to 1.30c. per lb.).

Bar iron prices are strongly fluctuating and have come down to an official works base price of 120 gold marks per ton (1.30c. per lb.). Wholesalers in need of ready cash are selling at about 115 marks, which would correspond to a base price of about 108 marks (1.17c.). There are large stocks of bar iron and some are realized below current market quotations in order to procure ready funds. Owing to the depression in the building industry, demand in bar iron and structural shapes from this quarter remains small. Reinforcing iron is in especially cheap lots in the market. Rolled wire prices are about 142 gold marks per ton (1.53c. per lb.) but

few orders are booked. The following are about average prices:

	Gold Marks Per Metric Ton	American Equivalent
Ingots	90 to 95	$21.78 to $23.00
Blooms	95 to 100	23.00 to 24.20
Billets	105	25.41
Sheet bars	108	26.14
Wire rods	130 to 135	31.46 to 32.67
Bar iron	115	1.24c.
Structural shapes	113	1.22c.
Universal iron	125	1.35c.
Hoop iron	160	1.73c.
Sheets, heavy	130 to 132	1.40c. to 1.43c.
Sheets, medium	140 to 145	1.51c. to 1.57c.
Plates, 1 to 3 mm.	160	1.73c.
Plates, below 1 mm.	175	1.89c.
Wire, bright	170	1.84c.
Wire, galvanized	210	2.27c.

Owing to the rebates granted by some firms and the undercutting by the traders it is difficult to determine quotations, but the above may be regarded as fair average. Export prices in rolled material are weakening, also.

The home market in pipe is quiet and prices are depressed. There is little demand for gas pipe from the building trade and, as the manufacturers of locomotives and boilers are poorly employed, demand for boiler tubes is small. Some traders are realizing their stocks at prices below works quotations and manufacturers are forced to make concessions. Export trade is far from normal, but the Rhenish-Westphalian works have booked some substantial export orders recently, it is said, at prices which leave only a small margin of profit. Endeavors to strengthen the Tube Syndicate are continued but there is no likelihood that they will meet with success under the present conditions in the market.

REPARATIONS DISTURB FRENCH

Iron and Steel Market Awaits Results of London Conference—Sheets in Good Position

PARIS, FRANCE, Aug. 8.—The London conference is drawing to a close and, even if an agreement is made with the Germans, France will come out of this conference diminished economically, financially and politically. There is, in such conditions, no prospect of a revival in business, the anxiety and uncertainty of the future, with the instability of exchange, being adverse factors. At home the current of orders is weak and the greatest efforts are made to reduce output, which does not impede the falling of prices. Export business also is quiet, the depreciation of our currency being no longer sufficient to galvanize the demand, and German competition is getting increasingly active.

Coke.—The supply of coke to the ORCA for July amounted to 358,861 tons, a daily average of 11,577 tons. For the first five days of August the deliveries through Ehrang and Aix-la-Chapelle were 39,525 tons, a daily average of 7905 tons. The deliveries are being lowered at the request of French industrialists, who find themselves unable to store any more supplies. These are stored temporarily in the Ruhr, but this situation may become awkward if the Ruhr is evacuated and if the railroads are put again into the hands of the Germans.

The price of coke is unaltered so far and likely will remain on the same level (fr. 150.75, or $8.30, all ORCA's charges included) for the month of August.

Pig Iron.—Production, already lower in June, has been curtailed further in July. In spite of the price concessions allowed by producers, there is no report of improvement in the marketing and a large number of furnaces are obliged to stock their output. Chill-cast iron No. 3 is now worth fr. 315 to 325 ($17.35 to $17.90) and forge iron fr. 300 to 310 ($16.52 to $17.07); usually these two kinds of iron differ by fr. 50. The prices above apply to August; for September they stand a little firmer. In July a founders' cooperative association buying price was established on the average of fr. 318.90 ($17.56) for chill-cast iron No. 3. For export identical prices are asked by Lorraine, Luxemburg and Belgian plants at fr. 360 to 370 for chill-cast iron and fr. 350 to 360 for forge iron (in French currency, fr. 338 and fr. 329, or $18.61 and $18.12). The minimum prices paid by British importers for chill-cast iron No. 3 and forge iron are respectively 79s. and 74s., f.o.b., this corresponding to about fr. 340 and fr. 320 of our money, or $18.72 and $17.62 at works. There is a fair amount of trade in hematite at export, owing to exchange. Transactions are being continued with Italy and Czecho-Slovakia at fr. 430 to 440 ($23.68 to $24.23) per ton at works or delivered, according to region and position of the plants.

Ferroalloys.—This section remains active and orders from Luxemburg and Belgian works absorb easily the surplus of the output. On the whole the Comptoir Electrométallurgique has left its prices unaltered for August. However, ferrosilicon 75 per cent advanced fr. 25 to fr. 1875 ($103.25), while the 90 per cent grade was lowered fr. 100 to fr. 2600 ($143.17). Silicospiegel 10 to 12 per cent Si and 18 to 20 per cent Mn is increased by fr. 30 to fr. 850 ($46.80).

Semi-Finished Products.—The market is quiet. The production of steel, lower during the month of June, is now increased by the output of two important works again in operation: the Aciéries de Micheville, in the East region and the Denain-Anzan plants, in the North, and which output has to find an outlet. Indeed, the competition of these two leading enterprises already is being felt on the inland market. Owing to the depreciation of the franc, there is slight improvement in our export transactions.

At home prices stand as follows: Ingots, fr. 39 to 40.50 ($21.47 to $22.30 per gross ton); blooms, fr. 42 to 43.50 ($23.13 to $23.95); billets, fr. 45 to 46.50 ($24.78 to $25.60); largets, fr. 55 to 56.50 per 100 kilos ($30.29 to $31.10), in basic steel. For export same prices from both Luxemburg and Belgian plants, and the Lorraine prices are a little firmer. The following are the current rates applied f.o.b. Antwerp: Basic blooms, fr. 480; billets, fr. 500; largets, fr. 540 (Belgian currency). The rates in sterling are: Blooms, £5 to £5 2s. 6d. ($22.30 to $22.86); billets, £5 2s. 6d. to £5 5s. ($22.86 to $23.42); largets, £5 7s. 6d. to £5 10s. ($23.98 to $24.53). These are the very lowest, as a Luxemburg Comptoir is reported to be selling billets at £5 14s. ($25.42) and largets at £5 17s. 6d. ($26.20), f.o.b. Further declines have occurred in German prices, now on the average of 105 gold marks ($25.41) for billets; the Germans are distributing bounties to their own industrialists to increase their export activity.

Rolled Steels.—On the foreign markets there is keen competition between the German and Luxemburg plants, and prices are less firm. Inland rates are, for soft steel bars, fr. 56 to 58 (1.38c. to 1.43c. per lb); rounds for bolts, fr. 58 to 60 (1.43c. to 1.48c.); rounds for steel concrete, fr. 56 to 58 (1.38c. to 1.43c.); beams, fr. 52 to 54 (1.28c. to 1.33c.); rails, fr. 46 to 48 ($25.33 to $26.42 per gross ton). The Aciéries de Denain-Anzin is back on the market for the sale of merchant iron; flat iron, 60 x 11 cm. and 80 x 20 cm. have been sold at fr. 75 per 100 kilos (1.84c. per lb.), delivered Paris. In the Sarre region tenders for hoops and semi-round steels are made on the basis of fr. 75 per 100 kilos on trucks, frontier station, and free of customs duties.

Wire rod is worth fr. 67 per 100 kilos ($36.90 per gross ton). At export the Belgian and Luxemburg plants are trying, in spite of the revival of the Belgian franc, to maintain their prices of fr. 550 to 560 for beams and fr. 570 to 580 for bars, or £5 16s. 6d. (1.16c. per lb.) for beams and £5 17s. 6d. to £6 (1.18c. to 1.19c.) for bars. But the competition is so keen that concessions are granted easily. The Germans have just reduced their price for iron bars to 115 gold-marks. (1.24c. per lb.).

Sheets.—This section remains satisfactory, although fresh business is getting scarcer. The plants are still busy for one or two months. In heavy and medium grades delivery times are being shortened, in 3 mm. sheets (No. 11½ gage) and over, the Northern plants are able to deliver in four to six weeks. Prices have been unaltered for about a week.

To check German competition the Belgian plants

are offering heavy sheets for export at £7 7s. 6d. (fr. 700 or 1.47c. per lb.), but their inland rates are fr. 710 to 715 (1.49c. to 1.50c.). Following are the approximate prices quoted in Belgium (in Belgian currency): 3-mm. sheets, fr. 730 to 740 (1.53c. to 1.55c.); 2-mm. (No. 14 gage), fr. 800 to 820 (1.68c. to 1.72c.); 1½-mm. (No. 16½ gage), fr. 940 to 950 (1.97c. to 2c.); 1-mm. (No. 19½ gage), fr. 1075 to 1100 (2.26c. to 2.31c.); ½-mm. (No. 25½ gage), fr. 1275 to 1325 (2.68c. to 2.78c.).

BELGIAN PRICES MAINLY NOMINAL

Competition from Germany Severe—Business Hard to Get and Concessions the Rule

ANTWERP, BELGIUM, July 30—Prices obtainable, on account of German competition especially, are certainly low enough, even too low for our makers, considering their high producing costs. Some of them are no longer disposed to make further concessions and seriously think of cutting production. Many rely on the fact that Germans will not soon cease to place their entire production on foreign markets at always lower prices. In fact, as no inland purchases are being made in Germany, makers really were obliged to look after orders on the international markets only. Such an abnormal situation in that country may change at once, perhaps in a short time, according to the London decision and results obtained there as regards the proposed "Dawes Loan." Furthermore, during this period of general abstaining from buying, stocks certainly have become smaller and one may expect that purchasers will soon have to buy.

Pig Iron.—Prices for foundry pig iron are lower. Coke became cheaper and is quoted about fr. 150, i.e., $6.85 per ton. No. 3 high phosphorus foundry pig iron with 2.5 to 3 per cent Si was offered at fr. 375 to fr. 380, equaling $17.30 to $18 per gross ton, f.o.b. Antwerp, for the best grade. Hematite pig iron was cheaper and quoted £5 or $22, at which the English East Coast hematite pig iron was offered c.i.f. Antwerp. In fact, the English market also is mostly weak with lower prices. No important pig iron business was done.

Steel.—Quotations for steel products were uncertain. Business is difficult, as buyers always come forward with lower offers. Bar iron is reported with London importers at a price as low as £5 15s., being fr. 560 or $25.40, f.o.b. Antwerp. French makers quoted about 10 per cent higher, while Luxemburg makers put forward the same low prices as Belgian makers.

Iron.—Business for finished iron is scarce and prices differ in accordance with the situation of the seller's order book.

Sheets.—As Germans continue to offer freely at cheaper prices, Belgian makers, who moreover have to secure new orders, were compelled to make further concessions, especially for heavy matreial. For 5 mm. sheets prices such as £7 7s. 6d. or fr. 715, being $32.50 per ton f.o.b Antwerp, were accepted. Thin sheets maintain their former prices better as, for this class, foreign competition is not so strong and inland demand is of large importance.

Semi-Finished Products.—Many producers are on the market. Makers, however, keep to the last prices and cause a relative firmness, if compared with other commodities. Moreover, prices offered by English importers are too low and seem momentarily not to interest the greatest number of makers. The English bids are as low as £5 5s. for billets, equaling fr. 510 and $23.20 per ton, f.o.b. Antwerp, with respectively £5 2s. 6d. for blooms and £5 10s. for largets.

Today's prices, a large part of them nominal, were as follows:

	Fr.	Equivalent Price	
Foundry pig iron No. 3	380	$17.30	
Thomas pig iron	390	17.70	
Commercial iron No. 2	580	26.40	
Commercial iron No. 3	590	26.80	
Commercial iron No. 4	650	29.55	
Thomas ingots	440	20.00	
Thomas blooms	500	22.75	
Thomas billets	535	24.30	
Thomas largets	565	25.65	
Iron for bolts	725	33.40	
Wire rods	670	30.20	
Rails	700	31.80	
Open-hearth steel, ordinary quality	575	26.20	
Open-hearth, half hard	750	34.10	
Open-hearth, soft	650	29.55	
Open-hearth, special	900	40.90	
			Per Lb.
Heavy sheets, 5 mm. (No. 6½ gage) and more	720	33.20 or	1.51c.
Heavy sheets, 3 mm. (No. 11½ gage)	750	34.10 or	1.55c.
Heavy sheets, 2 mm. (No. 14 gage)	830	37.80 or	1.71c.
Heavy sheets, 1½ mm. (No. 16½ gage)	950	43.10 or	1.95c.
Heavy sheets, 1 mm. (No. 19½ gage)	1,100	50.00 or	2.27c.
Heavy sheets, ½ mm. (No. 25½ gage)	1,300	59.20 or	2.69c.
Polished sheets, average price	1,600	72.75 or	3.30c.
Galvanized sheets, 1 mm.	1,750	79.50 or	3.61c.
Galvanized sheets, 0.8 mm.	1,850	84.00 or	3.81c.
Galvanized sheets, 0.5 mm.	2,250	111.50 or	5.06c.
Bar iron	580	26.40 or	1.20c.
Joists (beams) and U-iron	570	25.90 or	1.17c.
Rods	675	30.65 or	1.39c.
Corrugated bars	700	31.80 or	1.44c.
Spring steel, open-hearth	1,150	52.25 or	2.37c.
Drawn steel, rounds	1,500	68.15 or	3.09c.
Drawn steel, squares	1,520	69.05 or	3.13c.
Drawn steel, hexagonals	1,600	72.75 or	3.30c.
Wire, galvanized	1,300	59.20 or	2.69c.
Wire, barbed	1,450	66.00 or	2.99c.
Wire nails, basis price	1,100	50.00 or	2.27c.

Above prices are for home consumption and for good quantities. They are lower than at the time of our last letter (July 19) and, notwithstanding that in several cases still lower quotations were put forward for export, nearly no business resulted. The market is truly weak. Demands are plentiful but no real desire for important purchases exists, while a large number of makers got very short of orders. For this reason quotations differ much from works to works and therefore we can give only an average idea of prices.

British Pig Iron and Steel in July

LONDON, ENGLAND, Aug. 16 (*By Cable*).—The pig iron production in July was 615,600 gross tons, which was an increase over the June output of 607,800 tons but was smaller than the May production. Total steel output in July was 693,300 tons, comparing with 651,500 tons in June.

Comparative production figures for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month	855,000	639,000
1920, per month	669,500	755,600
1921, per month	217,600	302,100
1922, per month	408,300	486,000
1923, per month	619,800	707,400
January, 1924	631,500	690,100
February	612,700	767,600
March	668,600	825,200
April	618,400	711,500
May	650,900	809,700
June	607,800	651,500
July	615,600	693,300

The July pig iron output of 615,600 tons compares with an average monthly production of 632,500 tons per month for the first half. The steel output in July of 693,300 tons contrasts with 741,900 tons per month to July 1, this year.

Belgian Iron and Steel Production

ANTWERP, BELGIUM, Aug. 2.—During the month of June the production in Belgium for 48 furnaces was approximately as follows:

	Tons
Pig iron	236,730
Steel ingots	218,640
Castings from furnaces	6,450
Finished steel	184,190
Finished iron	14,350

The membership of the American Society for Testing Materials continues to increase. During July there have been added 44 new members, making the total of new members so far this year 337, of which 121 are credited to the efforts of standing committees. The society membership is now 3524.

BRITISH FOREIGN TRADE

June Steel Exports Next to the Smallest This Year —Imports Declining

British steel exports in June at 334,775 gross tons were next to the smallest this year, the March figure being 299,691 tons. The amount for the first half has been 346,306 tons per month, or less than the 1923 monthly rate.

A decided drop from the heavy importations in May took place in June. At 231,140 tons they were the third largest this year. They compare with 241,989 tons per month for the first half and are nearly twice the 1923 monthly receipts of 127,800 tons. The imports for the first half this year of 1,451,936 tons compare with 762,225 tons to July 1, 1923.

Comparative data for both exports and imports, scrap included, are as follows:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
January, 1924	345,455	182,611
February	341,511	223,102
March	299,691	212,518
April	341,292	243,008
May	359,557	415,115
June	334,775	231,140
Average per month, 1923	369,800	127,800
Average per month, 1922	295,980	82,215
Average per month, 1921	144,885	152,734
Average per month, 1920	274,881	128,685
Average per month, 1919	188,519	50,801
Average per month, 1913	420,757	195,264

More detailed data of the exports are as follows:

Principal British Exports, Gross Tons per Month

	1913	1923	June 1923	June 1924
Pig iron	93,700	74,100	35,639	40,792
Ferroalloys			20,881	5,740
Steel rails	42,200	25,700	23,547	10,515
Steel plates	11,200	17,700	23,848	20,146
Galvanized sheets	63,500	53,800	47,756	50,818
Steel bars, rods, etc.	20,900	31,500	32,199	21,750
Tin plates	41,200	48,300	50,281	50,809
Black plates and sheets	11,700	29,500	32,561	27,872

Exports of scrap iron and steel in June were 10,343 tons, compared with 9815 tons per month in 1923 and with 12,880 tons per month in 1922. In 1913 they were 9600 tons per month.

Data as to importations of importance are as follows in tons per month:

	1913	1923	June, 1924
Iron ore	620,000	487,580	489,482
Manganese ore	50,100	43,420	34,872
Pig iron and ferroalloys	18,000	9,157	16,905

Imports of semi-finished steel to June were 525,028 tons, compared with 279,091 tons for the same five months in 1923. Of this year's total 262,841, or over half, came from Belgium.

Waste Elimination Campaign Stir More Industries Into Action

WASHINGTON, Aug. 19.—Benefits resulting to member industries of the American Hardware Manufacturers' Association through the elimination of excess varieties, models, sizes or types of their commodities, brought about with the cooperation of the Division of Simplified Practice, Department of Commerce, have caused inquiries from still other industries through the association, it was stated at the division.

Manufacturers of horse shoes, one of whom alone makes more than 900 varieties and sizes, have asked for information as to how reductions may be made in the interests of greater efficiency, greater labor stability and better service.

Makers of forged wrenches, discovering that a wide range of finishes and sizes of that product are being offered for sale, are investigating to see what eliminations can be made in the interest of greater economy.

Southern hardware jobbers, reflecting the attitude of the retail hardware men, have suggested that there is need for simplification of the varieties of finishes, widths and types of wire cloth. And the division is taking the subject up with the manufacturers and with other distributing and consuming interests.

The vast range of sizes, finishes, models and types of oil cans is another subject brought to the attention of the division, which, in cooperation with the American Hardware Manufacturers' Association, is studying whether fewer varieties would not do as well, with general benefits to manufacturer, distributor, retailer and user.

Still another suggestion which has been made to the division is that the widths and thicknesses of leather belting offer an excessive range and are subjects which might be studied with a view to fewer varieties, or to development of standards.

Sheet Sales in July Ahead of Previous Month

Sheet sales for July by independent manufacturers reporting to the National Association of Sheet and Tin Plate Manufacturers went well ahead of those of the previous month, totaling 135,998 net tons, compared with the June figure of 108,693 net tons. Production gained approximately 30,000 tons in July over June, and as shipments exceeded new business by more than 16,000 tons, the gain in sales is not reflected in the unfilled orders at the end of July. Figures for July compare with those for June and May in net tons, as follows:

	1924 July	1924 June	1924 May	July, 1923
Capacity	413,000	395,800	419,000	385,000
Percentage reporting	71.7	71.0	70.7	69.6
Sales	135,998	108,693	126,487	92,358
Production	144,291	114,807	176,582	174,910
Shipment	151,255	141,176	196,254	192,261
Unfilled orders	203,440	246,810	294,774	404,868
Unshipped stocks	70,798	82,465	89,548	109,068
Unsold stocks	39,621	45,776	43,319	32,062

Interchangeable and Adjustable Centers

The Eclipse Interchangeable Counterbore Co., 7410 St. Aubin Avenue, Detroit, has acquired the patent rights for and is marketing the Robinson adjustable center. In this design a high-speed insert is employed to take the wear and, being adjustable, its point may be ground for the major portion of its length. When the insert is worn out it may be replaced at once with a new one.

The insert or center point is of 18 per cent tungsten high speed steel, hardened, tempered and ground. Inserts of special materials are also available. The body or holder is of machine steel, pack hardened. The life of the high-speed insert is said to be from 5 to 20 times that of a carbon center, and being heat-resisting, the high-speed inserts will not burn or get rough.

Presidents of Steel Corporation Subsidiaries Meet

The presidents of the subsidiary companies of the United States Steel Corporation held a meeting Tuesday afternoon at the corporation offices. After the meeting Chairman Gary said:

"The presidents are here to discuss the report of THE IRON AGE concerning the elimination of the 12-hr. day. We think, after searching investigation, that there is very little occasion to complain of our corporation in respect to this matter."

In response to a question as to whether anything had been done in regard to Pittsburgh plus, Judge Gary said that Steel Corporation lawyers were still considering the matter, but no action had been taken. He said he might have some announcement to make after the meeting of directors next Tuesday.

Chicago Pig Iron Sales Show Gain

YOUNGSTOWN, Aug. 19.—Youngstown pig iron sales of the Youngstown Sheet & Tube Co. in the past two weeks at Chicago have equaled those of the previous 60 days, states an official. The company anticipates moderately good business until the November election, sufficient in volume to maintain the current operating rate. Firming of finished steel prices at prevailing levels is prophesied. The company reports active demand for steel products in the Chicago district.

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ESTABLISHED 1855

THE IRON AGE

EDITORS:

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Member of the Audit Bureau of Circulations and of Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President* — PRINTED IN U. S. A. — George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 26 Jackson Place, N. W. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1.

Subscription Price: United States and Possessions, Mexico, Cuba, $6.00; Canada, $8.50; Foreign, $12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

The Short Day at Steel Works

THE gratifying results of a year of effort in abolishing the 12-hr. day and the 7-day week at iron and steel works are told elsewhere in this issue of THE IRON AGE. Not only are authoritative statements by steel company presidents given, but IRON AGE representatives in the principal iron and steel manufacturing centers present in detail the facts as developed by their investigations.

One year ago it did not seem possible that so much could be accomplished as has actually been done since Aug. 16, 1923. So far as the Steel Corporation subsidiaries are concerned, the undertaking is virtually completed. In the case of some of the independent companies, much remains to be accomplished. Their greatest difficulty has been the opposition of the employees to shortening the hours at a time when men had difficulty in obtaining anything like regular employment and often had to be content with working three or four days a week. It is also to be considered that the compulsion of public sentiment in this matter has been concentrated upon the Steel Corporation, as the outstanding factor in the steel industry, and that there has been no singling out of any independent company for like pressure.

The attitude of the men, as referred to above, will continue at least so long as the mills are employed in part only, and the difficulties probably will not disappear when the capacity of the mills is again fully tested and the demand for iron and steel products is greater than the supply, as it surely will be in time. When there are more jobs than men, operating departments are likely to permit or even to encourage men to work longer hours in order to get out as much product as possible. On the other hand, when there are more men than jobs, owing to a slack demand for iron and steel products, the men are likely to insist upon working as long as possible. Hence, the short-day and short-week program will have to stand the test in periods of unusual prosperity and also in periods of depression. If, however, there is a determination on the part of the employers and a willingness on the part of the men, the more reasonable and humane hours of labor can be generally and permanently established.

In the investigations which have been made, one fact stands out prominently; that is, that great good has come to the homes of the employees on account of the shortening of the hours of labor. There is more time for the home side of life. That is to be counted as gain and is a factor to be kept constantly in mind. It is proper at the same time to refer in this connection to the experience of an eastern Pennsylvania steel company which for a time adopted the 8-hr. day but later went back to 12-hr. shifts. Not only had many of the men asked for a return to the old regime, but the management had been waited on by wives and mothers of employees, urging that the men be given longer hours, as the short day left them with more idle time on their hands than was good for them and their families wanted the increased earnings of the 12-hr. day.

The testimony as to the increased cost of the three-shift day is inconclusive. What is said in the Cabot Fund report on this point would give the impression that the increase is relatively small and in time may become much smaller. The most definite statement on this subject is that of the comptroller of the Steel Corporation, who says that in November and December of 1923 the extra cost was at the rate of $29,545,000 per year. Naturally there will be considerable variations due to fluctuating rate of output.

But the idea that has been fostered by the Boston propaganda that there can be such speeding up in continuous processes, under the short turn, as will give a compensating increase in tonnage is only a little more naive than some others that have been contributed from outside the industry. Blast furnace output is largely a function of the amount of air blown into the furnace. In the open-hearth furnace the time required for the metallurgical reactions has nothing to do with number of turns or number of men in attendance.

Whatever may be said about the good motives prompting the recent Cabot Fund investigation, there is abundant evidence that some very unre-

liable, or, to say the least, incompetent, witnesses were depended on for its "facts." Contrary to the statement of the report that the seven-day week in continuous processes "has perhaps been more widely established under the new system," the situation, as developed by the investigation of THE IRON AGE, is that the seven-day week has been very largely eliminated in connection with steel works operation.

Nor do the facts bear out the assertion in the Cabot Fund report that "a very large percentage of men in the basic processes in steel are working more than 10 hours a day for six days of the week."

Most of the large companies, including the subsidiaries of the Steel Corporation, have put the continuous processes on a three-turn basis, so that so far as their operations are concerned the 12-hr. day has been practically eliminated.

Economic Prospects

WITHOUT any doubt a good deal of our recent optimism has been founded on the prospect of an early composition in Europe. This will be a blessed thing, and in no wise to be deprecated, but it is to be doubted that many of our people appreciate what are going to be the consequences to us. The common idea is that we are going to have a greatly increased demand for our raw materials, which will be added to our already large domestic demand and will produce something akin to a boom in our business.

Something like that may be the first result, when Germany at length is buying with the money that we lend her. The popular thought does not run so far as thinking of what Germany is going to do with the raw materials that we supply and how the work of her people is going to be pushed and liquidated in order to pay interest charges, reparations, etc. As we see it, we must contemplate the loss of no small part of our foreign trade in manufactures, in view of our costly and slacking labor. The pressure of foreign goods against our own tariff barriers will steadily increase; and eventually there will be no small agitation for the reduction of those barriers to give Europe a chance to work for us.

Some of these possibilities have been foreseen by the more thoughtful of our statesmen, but few of them would venture to talk openly on the subject at present. There is, of course, going to be an enormous resistance on the part of both manufacturers and workmen who will be hurt by foreign competition. Everyone is going to plead for his own position, and men who may have agreed that Europe must be allowed to pay its debts to us in goods will make very definite reservations as to products in which they individually are interested. No human brain is able at present to foretell when and how this thing is going to be worked out.

In the meanwhile we are slowly going through readjustment in our own internal affairs. The migration of people away from the farms is increasing the supply of town labor. The transfer of industries from one part of the country to another where there are more favorable conditions, such as the moving of cotton manufacture from New England to the southern States, is releasing town labor. In such circumstances the law of supply and demand operates, in spite of the resistance of labor unions, and labor becomes cheaper and glad to do any work that is offered. Fortunately we have never come to any system of Government doles to maintain the unemployed.

In Great Britain the Government doles appear to be operating in a way to perpetuate unemployment. The idle men are reported to be comfortable and contented. The men who are employed are desirous of continuing the system, which protects them from competition for their jobs. The taxpayers foot the bill and the nation suffers from curtailed production. The policies of American labor unions, which cause many workers to prefer idleness rather than accept reduction of wages, come economically to about the same thing. But in the absence of Government sanction and management our economic restriction is not so severe as it is in Great Britain and natural forces will break through it here more quickly than there.

Some economists foresee the development of these things rather quickly; and some stock exchange houses that are inspired by them continue to be very bearish. Indications are that they are wrong, not in theory but in timing. The developments are likely to be very slow. In the meanwhile our population is so great and our consumptive requirements are so enormous, and we are having such a diversion of income to those that spend it principally for consumers' goods, that the prospect is for great activity, but at curtailed profits, for some time to come.

The setback in the first half of 1924 may now be attributed, even more clearly than it was contemporaneously, to temporary overproducing and overstocking, leading to a halt for digestion. There are evidences that that process is approaching completion. The enormous increase in the consumption of gasoline shows that our people are still living high. The probability is that they are going to continue to do so, no matter what ultimately may be the consequences. Of course the outlook now, as heretofore, is less favorable for business that is associated with the creation of capital goods.

Electrifying Power Plant Auxiliaries

IT would seem that the promise of economy from the electrification of steel mill drives has encouraged the electrification of auxiliaries that might better be steam driven. An example is the electrification of the pumps on which the entire plant depends for water. Where the source of water is distant from the boiler plant, these pumps are likely to be motor driven. Long steam pipes are held to be objectionable and steam driven spare pumps may not be provided. Obviously, with this arrangement, interruption of the flow of power would cause an immediate cessation of the flow of water, with enforced shut-downs of mills. Also, if the electrical fault is not remedied quickly enough to prevent depletion of the supply of water in the reservoirs, the furnaces may be badly damaged.

The electrical trouble may not mean a complete loss of power supply and yet it may cause disastrous complications. A short circuit that reduces the frequency and so lowers the speed of the pumps may diminish to the danger point the amount of water pumped. When the source of auxiliary power is the same as that supplying power to the mills, such a short circuit may be serious.

Electrification of steel mill auxiliaries, therefore, should not extend to the point contemplated for large public utilities, some of which are planning complete electrification of their auxiliaries, using emergency house turbines or house generators to assure a dependable source of power that will not be affected by faults on the main system. Refinements of control necessarily will be used to safeguard the auxiliary system of these stations and prevent cumulative stoppages should trouble occur. These refinements, assuring economies without sacrifice in reliability, are properly used in large central stations having highly skilled operating personnel, but they may not be adaptable to steel mill power stations. It would seem that the steel mill electrical engineer may well lean to the side of safety and allow the pioneering to be done by public utilities, which are better able to profit by small reductions in fuel consumption.

If essential auxiliaries are to be motor driven, spare steam turbine driven units should be available. If this duplication of equipment is not justified, turbine drives only should be used. The plan followed by central stations, of segregating the source of auxiliary electrical power from the main bus, is commendable, but it is not always applicable to small power stations.

Ore Yield in Pig Iron

WITH the progressive exhaustion of the higher grade iron ore deposits of the Lake Superior region, the annual presentation in the statistical report of the American Iron and Steel Institute of the average amount of iron ore consumed per ton of pig iron made is noted with particular interest. The report just issued shows for 1923 an average consumption of 1.798 tons of ore and 0.135 ton of scrap, cinder, scale, etc., making a total of 1.933 tons, against 1.920 tons in 1922.

While the statistics simply cover the whole industry and do not segregate the Lake Superior ores, this makes little difference, for in the past few years iron ore production in the United States outside the Lake Superior region has run barely 15 per cent of the total, whereas in the 20-year period ended ten years ago, or with 1913, the ore outside the Lake Superior region was 22 per cent. This change is in itself significant. The other ores are not exhausted, yet the trend is to the use of a greater proportion of Lake Superior ore. Increased ore imports do not explain, for imports have equaled less than one-half this 7 per cent difference, yet imports are not a new thing.

In a discussion of this subject, in THE IRON AGE of Oct. 4, 1923 (page 912), with particular reference to the statistics of 1922, it was noted that from 1911 on there was a continuous decrease in the amount of ferrous material charged into blast furnaces, per ton of pig iron made, except for a slight backset in 1917 and 1918. The year 1923 now shows another backset, but it is a very slight one. While from 1922 to 1923 the total charged increased from 1.920 tons to 1.933 tons, per ton of pig iron, there was a decrease of 0.019 ton in the scrap, cinder, scale, etc., with an increase of 0.032 ton in the ore. As the ore runs leaner than the other material it would naturally take more of it to replace the latter.

The generalization is therefore warranted that the decline in the amount of ferrous material charged to make a ton of pig iron which has been in progress since 1911 has not been reversed.

Statistical information from an entirely different source shows that the average iron content of Lake Superior iron ores has not decreased materially since 1911. On publication of the statistics for 1923 of iron content of Lake Superior ores, comment was made in THE IRON AGE of May 15, 1924 (page 1448), that the average iron content of the total shipments had remained practically constant for ten years. This comparison may now be made, that in the three years ended with 1911 the average number of units in the ore shipped was 51.8, while in the past three years the average was 51.9 units, whereas the amount of ferrous material charged into blast furnaces has decreased. A precise comparison is impossible, but the bare figures suggest that furnace practice is possibly getting 2 or 3 per cent better yield now than in 1911.

The steadiness of the average iron content of the Lake Superior ores year by year does not contradict the general principle that the richer ore deposits are being exhausted. Leaner ores are being beneficiated. Nor is the success of the American iron industry directly or completely dependent upon the number of units in the ore as shipped. Many other factors enter, particularly smeltability. There was a time when the distance of the Lake Superior ores from points of consumption was considered a great disadvantage, whereas today some observers refer to cheap transportation as being the making of the region.

CORRESPONDENCE

Favors Higher Duty on Fluorspar

To the Editor: During the past year 35 per cent of the fluorspar used in America came from abroad, and the question is now being asked as to why foreign producers of fluorspar are able to undersell American producers. The big argument is the lower foreign wage scale which is about one-third of the American wages, and foreign laborers are being paid in currency that is greatly depreciated. Another point is that American buyers are paying for the spar in American dollars, which are higher in value than most foreign currencies, and foreign producers particularly seek this market for that reason.

In most cases foreign fluorspar is a by-product from the lead and zinc mines, whereas in America we mine for spar alone. Some lead is found, but we mine principally for the spar. And they are able to carry the spar to America's market because many of the west-

bound vessels on the Atlantic run light, and bulk freight is given a rate that is mere ballast.

Fluorspar mining is a difficult proposition, and water is a serious factor, as a peculiarity of fluorspar deposits is the fact that there is usually a well defined underground water course flowing along the vein. In the larger operations in Illinois they are pumping more than ten tons of water to one ton of spar.

It is in southern Illinois and Kentucky only that fluorspar is found in commercial quantities. The southern Illinois field, known as the Golconda district, has mined in the past more mineral than Kentucky, as all the large operators have heretofore concentrated in and around Golconda, but their operations have been so extensive and they have been so close to the Ohio River, that between the greater depth at which they have been compelled to mine, the water, and foreign competition, they now have a handicap which is hard to overcome, regardless of their past successes and their great financial resources.

There have never been any major operations in Kentucky, and the fluorspar that has been mined has been produced mostly by what are known as "wagon miners," bringing up a few tons per day and hauling the few tons mined by mule teams over bad roads anywhere from 15 to 25 miles to the nearest railroad station. In Kentucky the surface only has been scratched and it is estimated that there are thousands of tons still to be mined.

One of the large steel interests recently decided it was time to protect its fluorspar source of supply. After considerable investigation and expense in Illinois, it concluded that the Kentucky district offered the best prospects. It now owns a considerable acreage in that district. Its expenditures have been large; in fact, it could have kept itself supplied with fluorspar for many years with an amount equivalent to that which it had to spend to secure title. The company apparently expects to operate on a large scale and will have to make additional large outlays before it is producing in any quantity.

The leaders of the steel industry know that they cannot depend upon any other country for their fluorspar; in fact, almost all of the steel interests in America are awake to the fact that they, too, must have an assured source of supply from the only district that can consistently produce spar. They cannot depend upon the rate of exchange, the scale of wages and the other factors that at intervals allow the importation of foreign material.

Fluorspar is no ordinary material like iron ore, and if we could only be made to understand that it is not found in veins that go on indefinitely, as are iron ore or coal, our Government would give our domestic producers proper tariff protection. The problem of mining fluorspar would be simple if you could follow the vein for any known distance, or if the width of the vein remained true; but you cannot estimate accurately the length or the width. The tremendous upheavals which took place immediately preceding the formation of fluorspar disturbed and scattered the rocks, and if a pinch-out is encountered you may continue on straight ahead, to the right or left, up or down and may never find the vein again.

With proper tariff protection, about twice the present duty, the fluorspar deposits of America are a decided asset and our fluorspar production must be maintained sufficiently to permit of making the mine laborers proper American citizens, which after all should be the principal aim of every industry in the United States.

R. E. LUNDGREN,
Chicago, Aug. 7. Chicago Manager, Matthew Addy Co.

Shorter Annealing Time for Malleable Castings

To the Editor: Dr. Hayes and Dr. Diederichs are incorrect in their assumption, in your issue of July 31, that the writer feels alarmed over the prospect of disappointment in the malleable castings industry as the result of their experiments. Any disappointment will be that of the consumer, who, less familiar than Dr. Hayes with the commercial limitations under which the product is made, expects these experiments immediately to bear fruit in practice.

The realization of the ability to make "31-hour malleable," from the "possibility" of making it, awaits the technical and economic solution of difficulties already understood by the investigators, if not by the consumers. Whether these solutions, on a manufacturing scale, involving as an incident the complete replacement of the country's annealing equipment by an as yet unknown type, are near or far is unpredictable. They cannot be in the immediate future.

The publication of authentic information from university sources, as, for example, in the present case, and previously by Storey of Wisconsin and White and his co-workers of Michigan, cannot but be a stimulus to all concerned, and as such is welcomed by none more heartily than by the industry itself. It will have its greatest value, however, when viewed in a proper perspective, toward which end, it was hoped, the present writers' comments might have some value.

The possibility must not be overlooked, however, that the industry is not necessarily limited in knowledge to that publicly available, but may have also private sources of information.

Certified Malleable Meets High Tests

The writer's comparison of the physical properties of Dr. Hayes' product with that commercially produced from the same material had for its object a demonstration of the fact that excessive acceleration of annealing was accompanied by decreased quality of product. If the reference by Dr. Hayes and Dr. Diederichs to the high standard maintained by the plant in question is intended to mean that in general the industry does not produce metal superior to their experimental product, then they have overlooked the fact that all producers of "certified" malleable must maintain *ipso facto* a product above 50,000 lb. tensile strength and 10 per cent in elongation. As a matter of fact, the average for "certified" malleable is now about 54,000 lb. per sq. in. and 18 per cent elongation.

The quality of malleable made ten years or more ago has now, of course, only historic importance. From 22 years of contact with the industry, however, the writer is not in agreement with the statement that before that time it was unusual even for the best makers to produce a product superior to 44,000 lb. per sq. in. and 8 per cent in elongation. The present form of test specimen was adopted by the A. S. T. M. in 1915. Before that time all sorts of forms were in use, so that in the earlier tests this matter enters as a variable. Furthermore, although the present metallurgical principles determining quality have been known in some quarters for at least 20 years, it must be remembered that there was no expressed demand from the consuming interests calculated to standardize production on a high quality basis.

In spite of these facts, some producers consistently maintained a product which, either by the test specimens then in use or by those since adopted, would not only occasionally exceed the figures quoted, but would average better than these and rarely fall below them.

The great contribution of the American Malleable Castings Association to the development of the industry has been that by education and supervision it has raised the standards of the less efficient more nearly to the plane of the most efficient, thus securing an improvement in average of quality and in uniformity.

These latter facts bear but an incidental relation to the question of 31-hour malleable, and constitute a digression from the writer's major thesis, that there is no likelihood of any important decrease in annealing time for a product made under commercial limitations of operation and cost in the immediate future.

H. A. SCHWARTZ,
Cleveland, Aug. 11. Manager of Research,
National Malleable & Steel Castings Co.

The plant of the National Cement Co. at Ragland, Ala., was destroyed by fire Aug. 17. Loss, $750,000. The plant will be rebuilt.

Iron and Steel Markets

RAILROAD BUYING

Large Car Inquiries Pending at Chicago

Steel Output Increased Slightly, While Markets Show Fresh Concessions

The rate of steel ingot output this week again indicates a small increase for the industry as a whole, and again larger operation is accompanied by yielding prices in important products, more particularly plates, shapes, bars and wire.

At the same time the Chicago district furnishes some items in an improved railroad demand that has been talked of for weeks, but more as a hope than as a definite expectation. The first of these is the probable placing of steel this week for 1000 hopper cars by the Chesapeake & Ohio. Inquiry has been made by the Illinois Central for 6400 freight cars and 25 locomotives, while the Santa Fe is expected to come into the market soon for 5000 cars and the Texas & Pacific for 2000.

The Great Northern has just closed for 11,000 tons of tie plates and angle bars in addition to track spikes and bolts. From several roads there is promise of releases on rail contracts that will permit the early starting of the rail mill at Gary.

Estimates of operating rates show increases by independent companies in the Youngstown and Chicago districts, and to a less extent at Pittsburgh. Our Pittsburgh report points out that newspaper accounts paint a rosier picture of operations in that and nearby districts than actually exists.

The Steel Corporation is reported to be somewhat above 55 per cent on ingots and slightly higher on rolled products. The entire industry was probably close to 55 per cent as the week began, but in some cases there is less than a six-day operation at the scheduled rate. One blast furnace has been started up at Pittsburgh and another at Youngstown, both by independent steel companies.

The course of prices has not encouraged freer buying, but the low state of jobbers' stocks, particularly in the districts supplied from Chicago, has brought the mills fresh orders for warehouses there as well as for fabricators' stocks.

The new concessions on plates, shapes, bars and wire products are from $1 to $2 a ton, and in the wider sizes of hot-rolled flats competition is sharper. In sheets, larger producers are commonly holding to the 3.50c. basis for black and to 4.60c. for galvanized, and in bolts, nuts and rivets there is a more serious effort to stabilize prices than has been seen in months.

A falling off is indicated in structural steel work. Bookings for the sizable jobs so far in August have averaged 23,000 tons weekly, against 30,000 for the month preceding. The volume of fresh projects appearing has averaged less than 14,000 tons weekly, as compared with 26,000 tons for July.

Sheet sales of independent mills reporting to the National Association of Sheet and Tin Plate Manufacturers amounted to 135,998 net tons in July, or over 25 per cent more than in June. Production increased in the same ratio over June output and again exceeded sales, and shipments in turn exceeded production, with the result that unsold stocks were reduced in the month from 45,776 to 39,621 tons in the face of a better rate of buying.

Following the buying of 20,000 tons of foundry pig iron by a sanitary company, prices on this grade have been generally advanced $1 in the Pittsburgh district, while at Cleveland and in Michigan territory foundry and malleable have been put up 50c. by leading sellers. In nearly all centers pig iron is stronger, but Southern producers find it difficult to get away from the $17.50 quotation at Birmingham. Of 25,000 tons of basic iron recently bought in the East, 5000 tons will come from India.

Active competition from British ferromanganese has resulted in a ragged and fairly active market. The fresh decline is at least $4 to $95, and lower prices are reported by some buyers.

Orders for cast iron pipe from smaller municipalities are below expectations, though the time limit on new summer and fall work is near.

The steel trade does not share the optimism of some estimates of larger domestic steel exports, following the London agreement with Germany. Quick results are not likely, but ultimately increased imports of European steel are looked for, particularly on the Pacific Coast.

Mitsui & Co., New York, have completed purchases of machine tool equipment totaling $500,000 or more for their client, the Shibaura Engineering Co. of Japan, which is closely affiliated with the General Electric Co. One company took about $200,000 worth of the business.

THE IRON AGE composite prices again have moved in opposite directions. That for pig iron has advanced to $19.46 per gross ton from $19.38 last week and that for finished steel is 2.510c. per lb. against 2.517c. last week. In two weeks pig iron has advanced 17c. per gross ton and steel has declined 28c. per net ton.

Pittsburgh

Pig Iron Firmer—Shading of Plates and Bars Continues

PITTSBURGH, Aug. 19.—The steel situation has developed no characteristics in the past week that it has not shown for the past four or five weeks. Orders in most products continue to gain in number and this development is attended by a steady, gradual expansion in plant activities, but as yet there are no striking instances of buyers being inclined to anticipate their requirements and a cheerful sentiment, which still prevails, finds its explanation in what the future is expected to produce, rather than in the size of the current demands.

The sheet market appears to be slightly firmer than it was a few weeks ago, but over against this development is the continued weakness in plates and more frequent quoting of less than 2.15c. base, Pittsburgh, on steel bars. Some uncertainty still exists as to the

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Aug. 19, 1924	Aug. 12, 1924	July 22, 1924	Aug. 21, 1923
No. 2X, Philadelphia†	**$21.76**	$21.26	$21.26	$25.76
No. 2, Valley Furnace†	19.00	19.00	19.00	25.00
No. 2, Southern, Cin'ti†	21.55	21.55	22.05	27.55
No. 2, Birmingham, Ala†	17.50	17.50	18.00	24.00
No. 2 foundry, Chicago*	20.50	20.50	19.50	27.00
Basic, del'd, eastern Pa.	20.00	20.00	20.00	25.00
Basic, Valley furnace	19.00	19.00	19.00	25.00
Valley Bessemer del. P'gh.	21.76	21.76	21.76	28.26
Malleable, Chicago*	20.50	20.50	19.50	27.00
Malleable, Valley	19.00	19.00	19.00	24.50
Gray forge, Pittsburgh	20.26	20.26	20.26	25.76
L. S. charcoal, Chicago	29.04	29.04	29.04	32.15
Ferromanganese, furnace	*95.00*	99.00	105.00	117.50

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	38.00	38.00	38.00	42.50
O.-h. billets, Pittsburgh	38.00	38.00	38.00	42.50
O.-h. sheet bars, P'gh.	38.00	38.00	38.00	42.50
Forging billets, base, P'gh.	43.00	43.00	43.00	47.50
O.-h. billets, Phila.	43.17	43.17	43.17	47.67
Wire rods, Pittsburgh	46.00	46.00	48.00	51.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.00	2.00	2.15	2.40
Light rails at mill	1.85	1.85	1.90	2.25

Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.42	2.42	2.42	2.67
Iron bars, Chicago	*2.15*	2.20	2.20	2.40
Steel bars, Pittsburgh	*2.10*	2.15	2.15	2.40
Steel bars, Chicago	*2.10*	2.15	2.15	2.60
Steel bars, New York	*2.44*	2.49	2.49	2.74
Tank plates, Pittsburgh	*1.90*	2.00	2.00	2.50
Tank plates, Chicago	*2.15*	2.25	2.25	2.80
Tank plates, New York	2.09	2.09	2.14	2.84
Beams, Pittsburgh	2.00	2.00	2.00	2.50
Beams, Chicago	*2.15*	2.25	2.25	2.70
Beams, New York	2.34	2.34	2.34	2.84
Steel hoops, Pittsburgh	2.60	2.60	2.60	3.15

Sheets, Nails and Wire,	Aug. 19, 1924	Aug. 12, 1924	July 22, 1924	Aug. 21, 1923
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	**3.50**	3.40	3.40	3.75
Sheets, galv., No. 28, P'gh.	**4.60**	4.50	4.50	5.00
Sheets, blue an'l'd, 9 & 10	**2.65**	2.60	2.60	3.00
Wire nails, Pittsburgh	2.80	2.80	2.85	3.00
Plain wire, Pittsburgh	2.55	2.55	2.60	2.75
Barbed wire, galv., P'gh.	3.50	3.50	3.55	3.80
Tin plate, 100-lb. box, P'gh.	$5.50	$5.50	$5.50	$5.50

Old Material,				
Per Gross Ton:				
Carwheels, Chicago	**$17.00**	$17.00	$16.50	$19.50
Carwheels, Philadelphia	**18.00**	17.50	17.50	20.00
Heavy steel scrap, P'gh.	17.50	17.50	18.00	18.00
Heavy steel scrap, Phila.	17.00	17.00	15.50	16.00
Heavy steel scrap, Ch'go	15.50	15.50	15.25	16.00
No. 1 cast, Pittsburgh	18.00	18.00	18.00	21.50
No. 1 cast, Philadelphia	**19.00**	17.00	17.00	20.00
No. 1 cast, Ch'go (net ton)	17.50	17.50	17.00	17.50
No. 1 RR. wrot, Phila.	**19.50**	18.00	18.00	18.00
No. 1 RR. wrot. Ch'go (net)	13.75	13.75	13.00	14.00

Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$3.00	$3.00	$4.50
Foundry coke, prompt	4.00	4.00	4.00	5.50

Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*13.75*	13.75½	12.87½	14.25
Electrolytic copper, refinery	**13.50**	13.37½	12.50	13.75
Zinc, St. Louis	**6.22½**	6.17½	5.92½	6.45
Zinc, New York	**6.57½**	6.52½	6.27½	6.80
Lead, St. Louis	**8.00**	7.60	6.85	6.45
Lead, New York	**8.20**	7.87½	7.10	6.70
Tin (Straits), New York	**52.37½**	51.62½	48.75	39.37½
Antimony (Asiatic), N. Y.	**9.75**	9.12½	8.37½	7.62½

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market report on other pages.

THE IRON AGE Composite Prices

Aug. 19, 1924, Finished Steel, 2.510c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.

Aug. 12, 1924,	2.517c.
July 22, 1924,	2.524c.
Aug. 21, 1923,	2.775c.
10-year pre-war average,	1.689c.

Aug. 19, 1924, Pig Iron, $19.46 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.

Aug. 12, 1924,	$19.38
July 22, 1924,	19.29
Aug. 21, 1923,	25.29
10-year pre-war average,	15.72

1924 to Date				1923	
High		Low		High	Low
2.789c., Jan. 15		2.510c., Aug. 19	**Finished Steel**	2.824c., April 24	2.446c., Jan. 2
$22.88, Feb. 26		$19.29, July 8	**Pig Iron**	$30.86, March 20	$20.77, Nov. 20

prices of wire products and in the wider sizes of hot-rolled flats price competition is very sharp, to the advantage of the users of that material. Bolt, nut and rivet manufacturers have generally adopted new prices and discounts showing a slight advance over recent quotations and that branch of the industry now appears to be more stabilized as to prices than it has been before in a year.

Newspaper accounts of steel plant activities as a rule paint a rosier picture than actually exists so far as this and nearby districts are concerned. Ingot production is not averaging much, if any, in excess of 50 per cent of capacity. Figured on a numerical basis, engagement of rolling mill capacity, particularly in the case of sheets and tin plates, is not so full as published accounts would indicate, because all plants are not yet working six days a week. The Jones & Laughlin Steel Corporation has put on a blast furnace at its South Side works and the Youngstown Sheet & Tube Co. has put on a stack at Youngstown since a week ago.

Following some fairly large fourth quarter bookings of foundry iron at $19, producers generally have advanced the price on this grade $1 a ton and a few sales, mostly of small lots, have been made at the higher figure. As yet the steel making grades of iron have not responded to the strength in foundry grade. That is not hard to understand, since stocks of foundry iron have been decreasing pretty steadily over the past few weeks and that has not been the case with merchant stocks of steel-making iron.

While prices of scrap remain at about last week's

levels, there seems to be a little more anxiety on the part of dealers to find an outlet for tonnages for quick shipment. Steel makers outside of Pittsburgh have been much freer buyers of scrap than those located in the Pittsburgh district.

Efforts of coke producers to boost prices on the score of a better demand for coal and more profit in coal than in coke at present levels, so far have not been very successful.

Pig Iron.—This market is stronger on foundry iron. The Standard Sanitary Mfg. Co. closed late last week for approximately 20,000 tons for its local and Southern plants for fourth quarter shipment, paying $19, base, for the Northern iron and $17.50 base, Birmingham, for its Southern requirements. The Northern iron was divided between the Valley and western Pennsylvania furnaces. On only a small part of the Northern iron will the delivered price run as high as $20.76 for No. 2 grade. Regular customers of merchant producers also were able to cover their fourth quarter requirements at $19 base, but with the accumulation of this backlog tonnage merchant producers advanced prices $1 a ton and the steel companies making foundry grade also have advanced to $20, furnace, for No. 2. Sales at the new price include one lot of 3500 tons and several smaller lots, which bring the total sales at $20, furnace, for No. 2 to about 4000 tons. While it is probable that no iron can now be bought at less than $20, the business of the week calls for a range of from $19 to $20. Malleable iron is quoted up to $20, furnace, but $19 to $19.50 is the range based on sales. A few fair sized sales of basic are included in the week's transactions and on all of them a quotation of $19, Valley furnace, failed to bring the business. The American Steel Foundries is reported to have closed on 3000 tons for its Alliance, Ohio, works at slightly less than $19, Valley furnace equivalent, and the Pittsburgh Steel Foundry Co., Glassport, Pa., was able to buy 3000 tons at slightly less than $19, Valley furnace basis. A West Virginia sheet maker also bought about 3000 tons of basic iron for September delivery, getting the iron from a neighboring steel company at less than $19, figured back to the Valley. Some merchant producers now are quoting basic at $20, but this as yet is an asking price. No sales of Bessemer iron are noted at higher than $20, Valley or Johnstown, although $21 is asked at both points. One sale of 400 tons of Bessemer is noted at $20 at Valley furnace.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$19.00 to $20.00
Bessemer	20.00 to 21.00
Gray forge	18.50 to 19.50
No. 2 foundry	19.00 to 20.00
No. 3 foundry	18.50 to 19.50
Malleable	19.00 to 20.00
Low phosphorus, copper free	27.00 to 28.00

Ferroalloys.—Reduction late last week by British producers of ferromanganese of $5 per ton to $95 c.i.f., Atlantic Seaboard, was followed by considerable unsettlement in the market, accompanied by reports that domestic producers had gone as low as $92 and that one British maker had gone as low as $90. Verification of bona fide quotations of below $95, however, is lacking, and such sales as have been made appear to have been at $95 for both domestic and British material. Consumers in the Pittsburgh district proper have been encouraged to hold back purchases by the latest reduction in prices and not much business has been done here. It is reported, however, that eastern Ohio and Wheeling district steel companies have been fairly free buyers, their takings being estimated at about 4000 tons. Only three producers of 50 per cent ferrosilicon are taking business in this territory; the two larger ones are quoting $74 to $75 delivered and the other $70. Business is slack in this material in this district. Spiegeleisen prices are easier, with $33, furnace, now the top on 20 per cent material. Some good sized purchases have been made by eastern Ohio alloy steel makers for delivery over the remainder of the year. Prices are given on page 477.

Semi-Finished Steel.—Not enough business is being done to give a clear line either on prices or tendencies. Finished products having dropped more from the top prices of the year than semi-finished steel, nonintegrated manufacturers are expecting a more natural alinement than now exists and figure this will be brought about by lower semi-finished steel prices rather than by an advance in prices of finished products. Shipments of billets, slabs and sheet bars now carrying a price of $38, Pittsburgh or Youngstown, usually are releases against unspecified second quarter tonnages. Most sheet, tin plate and strip makers are well supplied with steel, and it is doubtful whether they would be interested in fresh supplies for either early or fourth quarter shipment except at below today's quotations, which are untested and nominal. Wire rods no longer are quotable above $46, base, as that price now is being made even on small tonnages. Skelp prices are merely appraisals, little or no business as such being noted. Skelp mills are competing for strip business and that is one reason for the weakness of prices of the latter product. Ingot capacity is about 50 per cent engaged in this and nearby districts. Finishing mill activities are greater, but cold steel is being drawn upon to make up the deficiency. Prices are given on page 477.

Wire Products.—Orders still are gaining in number, but individually still are small and being all for early delivery, backlogs are not being accumulated. Moreover, the gain in demand is not reflected very fully in mill operations, as it is still possible to meet from mill stocks a good many of the demands, notably in nails, and that line is doing better than most others. No serious effort now is being made to obtain more than $2.80, base, per keg for nails and $2.55, base, per 100 lb. for plain wire, and there is no longer basis in sales for higher prices. Lower prices than $2.80 on nails, reported from the East, have not disturbed the price ideas of the mills so far as local business is concerned. Fence business is slow despite the optimism of economists and business forecasters as to the increased buying power of the farmers as a result of the appreciation in the value of farm products. Prices are given on page 476.

Tubular Goods.—Demand for merchant pipe is still improving, but it is still observed that the orders run to a number of sizes and that is taken to mean that the jobbers are rounding out, rather than building up, their stocks. This fall will see a good deal of house building in most parts of the country and heating demands usually run well in the fall. While the idea of a decline in prices seems to be disappearing, there are no expectations of higher prices in the near future and jobbers naturally are not buying much ahead of actual requirements. Demand for oil country pipe reflects the uncertainty in the oil situation. Most mills have some line pipe business and the leading interest is fairly heavily booked in this direction. Improvement in the boiler tube situation is confined entirely to demand, prices still being very much in buyers' favor. Discounts are given on page 476.

Sheets.—Business still is on the increase and while the bulk of the bookings is for early delivery, this is in keeping with the desires of manufacturers, who generally regard present prices as too low and therefore are not disposed to commit themselves beyond the present quarters at current quotations. It is believed there is more inclination among buyers to cover for the remainder of the year than was true recently, this possibly because prices are firmer to the extent that it is no longer easy to find makers willing to go as low as 3.40c. for black, 4.50c. for galvanized and 2.60c. for blue annealed, in this district the more common quotations are 3.50c. for black, 4.60c. for galvanized, although sales at 4.50c. are noted, and 2.65c. for blue annealed. The American Sheet & Tin Plate Co. continues to get Japanese business in light gage sheets and its total bookings over the last month or so now exceed 30,000 tons. It is also getting business in the heavier gages for Japan, recent bookings having totaled between 5000 and 6000 tons. Sheet production is running about 50 per cent of capacity. The number of mills active would indicate a higher rate, but few mills are being operated more than four days a week. Prices are given on page 476.

Tin Plate.—This branch of the steel industry is operating between 45 and 50 per cent of capacity and that

about measures the current demand. Doubt still exists as to the pack of the vegetable crops, since they are late and unfavorable weather is noted in a number of places where packing crops are grown on a big scale. There is no evidence yet that the packers are short of cans or the can makers short of tin plate, as real activity is lacking in stock items, which would be first sought to meet emergency demands. All makers of tin plate are carrying large stocks of seconds. The price on production tin plate remains pegged at $5.50 per base box, Pittsburgh, for standard cokes, for domestic account; sheet bars are off in price from where they were when that price was made, but the higher cost of pig tin offsets the cheaper steel.

Cold-Finished Steel Bars and Shafting.—Makers of automobile parts are loosening up somewhat in the matter of specifications against old orders and demands from other consuming industries show some increase. None of the makers, however, yet claim that business is good. The market is holding rather well at 2.80c., base, Pittsburgh, for rolled, drawn, polished and turned bars and shafting and 3.20c., base, f.o.b. mill, still is carload lot price of ground shafting.

Hot-Rolled Flats.—Prices are holding fairly well at around 2.60c., base, Pittsburgh, on the hoop and band sizes, but competition from competing materials still is so sharp in the wider sizes that prices are not very well defined. A net price is quoted in cases where large tonnages of wide strips are involved to meet the price competition created by owners of plate and jobbing mills who want business. Mills adhering to base prices on wide strips are quoting anywhere from 2.25c. to 2.50c., but it is admitted that only small lots are selling at the higher figure. Business is increasing and some makers report gains over last month of from 30 to 40 per cent. Prices are given on page 476.

Cold-Rolled Strips.—Recent prices of from 4c. to 4.25c. are holding, with the bulk of the bookings between those extremes. Inquiries and orders are increasing, but not at so rapid a pace as recently. Recent cut in automobile sheets, which meant a price of about 5.85c. for automobile fender stock, as against 6.05c. to 6.10c. for cold-rolled strip fender stock, threatened the latter to the extent that makers now are meeting the sheet steel price.

Bolts, Nuts and Rivets.—Bolt and nut makers quite generally are quoting large machine bolts at 60 and 20 per cent off list and hot-pressed nuts at 4.75c. off list for squares and 5.25c. off list for hexagons. They are making a firm stand at these discounts and since there are fewer deviations from them than formerly, business is coming in better. Leading makers of rivets here now are making a firm stand at $2.60, base, for large structural rivets and 70, 10 and 5 per cent off list for small, these prices being f.o.b. Pittsburgh. One maker here with a plant in the Chicago district is quoting $2.75, base, for large and 70 and 10 off list for small rivets, f.o.b. Chicago. Prices and discounts are given on page 476.

Track Supplies.—Local demands are moderate and makers are not very busy, since taking orders in outside districts means going lower on prices than they care to. Prices are given on page 476.

Iron and Steel Bars.—While 2.15c. is still the common objective of makers of steel bars in this and nearby districts, a quotation of 2.10c. lately has been frequent enough to be recognized as a market price. Demands run chiefly to small lots and while fairly numerous, evidently are not sufficient to give all makers economical rolling schedules. Iron bars are also easy and 2.90c. base now is the top of the market on refined iron bars, excepting in retail lots. Prices are given on page 476.

Structural Material.—There is still a relatively firm market in large structural shapes, although sales even of small lots for quick shipment no longer are easy to make at 2.15c. and 2.10c. is the more common maximum price. Large fabricating interests generally are buying at 2c. New inquiry in structural steel is much quieter than it was recently and there is considerable variation in the order books of the different companies. Some have as much as two months' work in sight, while others are dependent entirely on current demands. The shops which are best off on business find they are completing more tonnage than they are getting. Plain material prices are given on page 476.

Plates.—Prices of this product continue to soften and on single carloads buyers no longer have to go above 2c. base, Pittsburgh, to find accommodation. Lots that ordinarily would be regarded as small now appear large to mills and on these the prevailing market is 1.90c. Producers of plates are more numerous than buyers and competition for business is rather sharp. Prices are given on page 476.

Steel Rails.—Inquiry for light rails appears to be a little livelier than it was recently, but improvement in demand does not extend to prices, which still are favorable to buyers. The Pennsylvania Railroad recently released 5000 tons of standard rails against which it had held up shipment. Prices are given on page 476.

Coke and Coal.—Spot offerings of coke, both furnace and foundry, still are ample for requirements and prices are merely steady. Spot furnace coke is readily available in such quantities as it is wanted at $3 per net ton at ovens and one fair sized tonnage for September shipment was placed at the same price. Producers still are talking $3.25 as their minimum price on fourth quarter shipments, but furnace interests which have stacks in or are figuring on blowing in during the last quarter of the year are not much interested at that price. Spot foundry coke ranges from $4 to $4.50 per net ton at ovens, but there is not much business at the higher figure. Demand for coal is better, but not to the extent of bringing about any material stiffening of prices. Slack grade is scarce because of the light production of prepared sizes and prices are firm. Steam slack demands from $1.20 to $1.30 per net ton at mines and gas slack from $1.30 to $1.40. Mine run steam coal ranges from $1.50 to $1.75, mine run coking coal from $1.60 to $1.75, and mine run gas from $1.85 to $2.

Old Material.—No particular change is noted in prices, but efforts of dealers to secure orders are a little stronger than they were recently. Possibly this may be due to the fact that purchasers of the Pennsylvania Railroad material this month were advised that they had to give shipping directions in 10 days, instead of 30 days, as formerly allowed. Since some of the purchases were made in the expectation of a better market before the material had to be moved, it is probable that some melters will get some good steel at reasonable prices. Two Youngstown steel companies are reported to have bought heavy melting steel in the past week and to have paid $18 and $18.50. Locally, dealers have been trying to interest the mills in tonnages up to 1000 tons at $18, but without much success. The best bid is $17.50, but none of the dealers yet are willing to shade $18 and the quotable market on a bid and asked basis, therefore, is $17.50 to $18. It is hard to interest blast furnace interests in their kinds of material at present prices and the foundries are very sparing buyers. It is a difficult market for the dealers. The Baltimore & Ohio Railroad offers 11,180 gross tons of old material in a list, the first issued for about three months. Bids close on this list at noon Aug. 25.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$17.50 to $18.00
No. 1 cast, cupola size	18.00 to 18.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.50 to 19.50
Compressed sheet steel	16.00 to 16.50
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	20.00 to 20.50
Railroad coil and leaf springs	20.00 to 20.50
Low phosphorus blooms and billet ends	22.00 to 22.50
Low phosphorus plate and other material	21.00 to 21.50
Railroad malleable	16.00 to 16.50
Steel car axles	20.00 to 20.50
Cast iron wheels	16.50 to 17.00
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	14.00 to 14.50
Sheet bar crops	18.00 to 18.50
Heavy steel axle turnings	15.00 to 15.50
Short shoveling turnings	15.00 to 15.25
Heavy breakable cast	15.00 to 15.50
Stove plate	13.50 to 14.00
Cast iron borings	15.00 to 15.25
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	17.50 to 18.00

Chicago

Railroad Car Buying a Prominent Feature—Some Prices Lower

CHICAGO, Aug. 19.—Railroad car buying again promises to be a feature of the market. The Illinois Central has issued inquiries for 6400 freight cars and 25 locomotives, while the Santa Fe is expected to ask for figures on 5000 cars and the Texas & Pacific contemplates buying 2000. The marked improvement in the agricultural situation, together with the low level of present steel prices, is said to have altered the attitude of carriers, and liberal purchases of rolling stock, track supplies and rails are looked for. The Great Northern has placed 11,000 tons of tie plates and angle bars, as well as good orders for track spikes and bolts. Releases against rail contracts, together with fresh orders, are expected to enable the Gary mill to resume production shortly.

Although renewed railroad buying commands the center of the stage, steel mills are also gratified by the increasing interest manifested by jobbers, fabricators and miscellaneous users. For the first time in months warehouse interests and fabricators are buying for stock. While these purchases have not yet assumed large proportions, and are unlikely to do so as long as prompt deliveries are available from the mills, a number of handsome tonnages have been placed. Heretofore lack of confidence has caused steel consumers to postpone the purchase of everything except imperative immediate needs. Prices have now reached such a low level, however, that there is a growing feeling that little will be gained through further delay.

In the face of this improvement in sentiment, prices have not yet found stability, plates and shapes have declined to 2.15c., Chicago, and in some instances concessions to 2.10c. and even lower are reported. Soft steel bars have receded to 2.10c., Chicago.

Building activity continues to develop in encouraging volume and the farm implement industry is buying more liberally, although not without considerable caution. Automobile manufacturers, on the other hand, appear to have recovered little, if any, since the slump of early spring.

Improvement in steel bookings has found its first reflection in better operations among local independents, which range from 55 to 65 per cent. Other interests remain on a 42 per cent basis. The blast furnace situation is unchanged, with 14 furnaces active out of a total of 34 steel works stacks in the district.

Ferroalloys.—A local buyer has closed for 500 tons of ferromanganese on a receding market. Competition between foreign and domestic producers has brought the price of this commodity down to $94, seaboard. The minimum going price on spiegeleisen appears to be $33, New Orleans.

We quote 80 per cent ferromanganese, $101.56 delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $40.56, delivered.

Pig Iron.—A Wisconsin manufacturer of sanitary ware has closed for 12,000 tons of foundry and 1200 tons of silvery. This is the outstanding transaction in an otherwise quiet market. The advance in local iron to $20.50, base, has been followed by a period of hesitancy such as usually accompanies a rise in price. Here and there sales of a few hundred tons have been made at the new level, but buying cannot be described as active. The position of the furnaces, on the other hand, is steadily improving. With only one strictly merchant stack running in this district, stocks on furnace yards are being reduced and in a few analyses actually have been exhausted. In fact, present plans contemplate the blowing in of an Iroquois or a Federal stack in a week or two. Sales of Southern iron in this territory have been few, but tonnage for all rail delivery has declined to $17.50, base, Birmingham. A local melter is inquiring for 300 to 500 tons of low phosphorus for September to November delivery. This commodity is available at $31.29 to $32.29, delivered. Sales of about 1000 tons of off grade low phosphorus were negotiated in Milwaukee during the week. Melters in this vicinity have closed for 1000 tons and 150 tons of charcoal respectively at $26, base, furnace.

Quotations on Northern foundry, high phosphorus, malleable and basic iron are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25	$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75	21.00
Malleable, not over 2.25 sil.	20.50
Basic	20.50
High phosphorus	20.50
Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	29.04
Southern No. 2 (barge and rail)	22.18
Southern No. 2, sil. 1.75 to 2.25	23.51 to 24.01
Low phos., sil. 1 to 2 per cent, copper free	31.29 to 32.29
Silvery, sil. 8 per cent	$34.29 to 35.29
Electric ferrosilicon, 14 to 16 per cent	43.42

Plates.—One local mill has booked 10,000 tons of plates for oil storage tanks, while another has taken orders for 3500 tons of steel for railroad cars. No new tank inquiries have appeared on the market, but car buying promises to assume large proportions. The Chesapeake & Ohio is expected to close this week against 1000 70-ton hopper cars, and the Texas & Pacific contemplates entering the market for 2000 freight cars. Inquiries for rolling stock are reported to be on the verge of issuing by the Illinois Central and the Santa Fe. Notwithstanding signs of revival in demand, plates are still soft, with 2.15c., Chicago, rather generally quoted. In some cases as low as 2.10c. has been done on attractive lots, and in an extreme instance a large buyer obtained a price of 2c., Chicago.

The mill quotation is 2.15c., Chicago. Jobbers quote 3.10c. for plates out of stock.

Structural Material.—Building activity keeps up at an encouraging rate, although fabricating awards for the week include no conspicuously large tonnages. A number of large projects, however, are expected to be awarded shortly, among them a 124-pocket ore dock for the Great Northern at Allouez, Wis., requiring 4000 tons; the Standard Club Building, Chicago, 2800 tons; the Plankington Hotel addition, Milwaukee, 2500 tons; the Illinois Women's Athletic Club Building, Chicago, 2100 tons; and the First National Bank addition, Chicago, 2000 tons. Plans are now being made for a new group of medical buildings at the University of Chicago to require several thousand tons. Competition between fabricators remains keen, with the result that bids on current projects are low. Plain material prices are also weaker, with the bulk of business moving at 2.15c., Chicago, and some tonnage going at as low as 2.10c. The most favorable feature of the market is the appearance of orders for stock from both fabricators and jobbers. Apparently lack of confidence, which has heretofore contributed to the hesitancy of buyers, is becoming less of a factor with the recession of prices to current low levels.

The mill quotation on plain material is 2.15c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.

Reinforcing Bars.—The market for reinforcing bars in this district has developed a somewhat weaker tone. The warehouse price now takes a range from 2.25c. to 2.35c., and it is understood that the minimum price would yield to a slightly lower figure on attractive business. There still continues a fair degree of inquiries and some sizable awards for this class of tonnage are expected to be placed in the near future. It is understood that the general contract for the Hotel Sherman Annex, calling for approximately 600 tons, has been let and that the steel tonnage will be placed soon. Another inquiry calls for 200 to 300 tons for the Gray office building, Benton Harbor, Mich. The Concrete Steel Co. has taken 700 tons for the Grace Street sewer, Omaha.

Bars.—Encouraging crop reports from the Northwest and favorable grain prices have caused farm implement makers to place more liberal orders for both mild steel and rail steel bars in preparation for their fall production programs. Buying by jobbers and miscellaneous consumers is also expanding, but business from the automobile industry is below expectations. Soft steel bars are now rather generally available at 2.10c., Chicago, although some tonnage continues to command as high as 2.15c. Sympathetically rail steel bars have receded to 2c., Chicago, while bar iron is quoted at 2.15c. to 2.25c., Chicago. Much of the current rail steel business is coming from fence post manufacturers. Actual buying of bar iron is still light, but improved demand is in sight.

Mill prices are: Mild steel bars, 2.10c. to 2.15c.; common bar iron, 2.15c. to 2.20c., Chicago; rail steel, 2c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.80c. for rounds and 4.30c. for flats, squares and hexagons; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.25c. to 2.35c.

Sheets.—Although prices are still wobbly and in some instances extreme concessions are being made, the figures quoted below appear to be representative. Hesitancy on the part of buyers is gradually disappearing and in some cases purchases are being made for the rest of the year.

Mill quotations are 3.50c. for No. 28 black, 2.70c. for No. 10 blue annealed, and 4.60c. for No. 28 galvanized, all being Pittsburgh prices subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote f.o.b. Chicago: 3.80c. for blue annealed; 4.50c. for black, and 5.50c. for galvanized.

Hot-Rolled Strip.—Local mills are attempting to hold to 2.70c. to 2.75c., Chicago, but this is difficult in view of the weakness of prices at Pittsburgh, where as low as 2.40c. is being done. Demand is light owing to lack of interest by automobile manufacturers.

Wire Products.—Demand has improved to such an extent that sellers pronounce it good. Purchases are largely for immediate consumption, and it is unlikely that there will be much buying ahead so long as prompt shipments are available from the mills. Production is showing gradual betterment, now being estimated at 50 per cent. Stocks in mill warehouses are also being reduced. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 476.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.70 per 100 lb.; extra for black annealed wire, 15c. net 100 lb.; common wire nails, $3.55 per 100 lb.; cement coated nails, $2.80 per keg.

Rails and Track Supplies.—The Great Northern has placed orders for 6000 tons of tie plates, 90,000 pairs of angle bars, 5000 kegs of truck spikes and 2500 kegs of truck bolts. Approximately 65 per cent of this business went to Chicago mills and the remainder to Eastern producers. Local producers expect to receive generous releases against rail contracts soon; in fact, the Gary mill is preparing to resume operations.

Standard Bessemer and open-hearth rails, $43; light rails, rolled from billets, 2.10c., f.o.b. makers' mill.

Standard railroad spikes, 2.80c. to 3c. mill; track bolts with square nuts, 3.80c. to 4c. mill; steel tie plates, 2.45c., f.o.b. mill; angle bars, 2.75c., f.o.b mill.

Jobbers quote standard spikes out of warehouse at 3.45c. base, and track bolts, 4.45c. base.

Bolts and Nuts.—Notwithstanding efforts to advance prices, a number of sellers are still quoting on the basis of 60 and 20 off, Chicago, on large machine bolts. Business has improved, but it is still far from satisfactory. Orders from jobbers have been on a more encouraging scale than from the automobile and implement industries.

Jobbers quote structural rivets, 3.65c.; boiler rivets, 3.85c.; machine bolts up to ⅞ x 4 in., 60 per cent off; larger sizes, 60 off; carriage bolts up to ⅞ x 6 in., 55 off; larger sizes, 55 off; hot pressed nuts, squares and hexagons, tapped, $4 off; blank nuts, $4 off; coach or lag screws, gimlet points square head, 65 per cent off.

Cast Iron Pipe.—Orders from small municipalities have failed to come up to expectations, but in view of the season pipe shops are still disposed to regard the present situation as satisfactory. Prices, however, are easier, now ranging from $45 to $46 base, Birmingham. The American Cast Iron Pipe Co. will furnish 1050 tons for Lincoln Park, a suburb of Detroit, and 200 tons for Ames, Iowa. St. Paul has awarded 400 tons of 6-in. to the National Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry Co. will supply 200 tons of 16-in. for Dayton, Ohio. Detroit will take bids Aug. 26 on 1375 tons of 12-in., and Lincoln Park, Mich., took figures yesterday on 240 tons of 6- and 8-in. Kewanee, Ill., received tenders Aug. 16 on 250 tons of 4- and 6-in.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $57.20 to $58.20; 6-in. and over, $53.20 to $54.20; Class A and gas pipe, $5 extra.

Warehouse Prices.—Local jobbers have reduced structural and boiler rivets 15c. per 100 lb. and standard track spikes and bolts 20c. The new prices are carried under the appropriate paragraphs.

Old Material.—In a sluggish market, in which traders hesitate either to sell short or buy long, transactions are few and the trend of prices is less clearly defined. The general tendency, however, appears to be in the direction of further advances, although in many cases they do not exceed 25c. a ton. The low phosphorous grades take the lead as strong items. Consumer buying continues to drag. Railroad lists are large, including the Louisville & Nashville, 12,000 tons; the Baltimore & Ohio, 10,000 tons; the Rock Island, 3000 tons; the Grand Trunk, 1700 tons, and the Monon, 450 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

	Per Gross Ton	
Iron rails	$17.50 to	$18.00
Cast iron car wheels	17.00 to	17.50
Relaying rails, 56 and 60 lb.	26.00 to	27.00
Relaying rails, 65 lb. and heavier	27.00 to	32.00
Forged steel car wheels	18.50 to	19.00
Railroad tires, charging box size	18.50 to	19.00
Railroad leaf springs, cut apart	18.50 to	19.00
Rails for rolling	16.00 to	16.50
Steel rails, less than 3 ft.	17.50 to	18.00
Heavy melting steel	15.50 to	16.00
Frogs, switches and guards cut apart	15.50 to	16.00
Shoveling steel	15.00 to	15.50
Drop forge flashings	10.50 to	11.00
Hydraulic compressed sheets	12.50 to	13.00
Axle turnings	12.50 to	13.00
Steel angle bars	17.00 to	17.50
Steel knuckles and couplers	18.00 to	18.50
Coil springs	19.00 to	19.50
Low phos. punchings	16.50 to	17.00
Machine shop turnings	9.00 to	9.50
Cast borings	10.75 to	11.25
Short shoveling turnings	10.75 to	11.25
Railroad malleable	17.50 to	18.00
Agricultural malleable	16.00 to	16.50
Per Net Ton		
Iron angle and splice bars	16.50 to	17.00
Iron arch bars and transoms	17.50 to	18.00
Iron car axles	24.00 to	24.50
Steel car axles	18.00 to	18.50
No. 1 busheling	11.25 to	11.75
No. 2 busheling	8.25 to	8.75
Pipes and flues	10.50 to	11.00
No. 1 railroad wrought	13.75 to	14.25
No. 2 railroad wrought	13.50 to	14.00
No. 1 machinery cast	17.50 to	18.00
No. 1 railroad cast	16.50 to	17.00
No. 1 agricultural cast	16.50 to	17.00
Locomotive tires, smooth	16.00 to	16.50
Stove plate	14.00 to	14.50
Grate bars	15.00 to	15.50
Brake shoes	15.00 to	15.50

Scrap Firm at Youngstown

YOUNGSTOWN, Aug. 19.—Demand for scrap metals continues fairly firm in this district. Open hearth melters and blast furnace interests are making some purchases. Heavy melting scrap is pegged at $18 and sales have been made at this figure.

According to W. C. Durant, president the Locomobile Co., Bridgeport, Conn., automobiles, 750 are employed, the plant operating full, and there is sufficient unfilled business on the books to keep it on its present schedule two and one-half months.

New York

Fair Volume of Orders for Pig Iron and Finished Materials

NEW YORK, Aug. 19.—Following the purchase of 5000 tons of foundry iron by the Richardson & Boynton Co., as reported last week, other transactions later in the week amounted to about 15,000 tons, nearly all for fourth quarter. Tonnage pending is fully 10,000 and possibly 15,000 tons, the largest being 3000 tons of foundry and 1500 tons of malleable for the New York Air Brake Co. for fourth quarter delivery. One inquiry is for 2000 tons for September or October delivery. More cheerful feeling prevails in the market, prices in general are steadier, and one Buffalo seller has advanced to a basis of $19.50 for No. 2 plain, with $20 for No. 2X and $21 for No. 1X. There is a decided scarcity of high silicon iron owing to the fact that furnaces during the period of low prices made an unusually small percentage of high silicon iron. Eastern Pennsylvania prices are somewhat firmer and the $20 minimum is disappearing. One Buffalo furnace will not take any more high silicon iron orders for delivery prior to Oct. 1.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25	$22.27 to $22.77
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.27 to 23.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.77 to 23.27
Buffalo, sil. 1.75 to 2.25	23.91
No. 2 Virginia, sil. 1.75 to 2.25	29.94 to 30.44

Ferroalloys.—Another reduction in the price of ferromanganese appeared a few days ago and sellers, particularly British, report the sale of at least 10,000 tons, with probably some domestic alloy also changing hands. Rumors that the alloy could be bought at less than $95, seaboard, the new quotation, cannot be confirmed, and it is believed that this is the minimum price. There have been bids below this level, but no sales are confirmed. One representative of British makers is out of the market, not being allowed to sell any more at the present level. There is no substantial inquiry before the market. The spiegeleisen market is quiet but firm. No large business is reported as being negotiated or closed.

Cast Iron Pipe.—On certain sizes of water pipe, makers, as a rule, are booked well up to November, the great majority of the orders being from private water and gas companies. The year will evidently prove to have been a period of light purchasing by municipalities. Prices continue fairly firm. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $60.60 to $61.60; 4-in. and 5-in., $65.60 to $66.60; 3-in., $75.60 to $76.60, with $5 additional for Class A and gas pipe. Demand for soil pipe shows a slight increase, but makers are still in a position to make practically as prompt delivery as may be required. Most of the current orders are for immediate shipment of small lots. We quote discounts of both Southern and Northern makers, f.o.b. New York, as follows: 6-in., 45 to 46¼ per cent off list; heavy, 55 to 56¼ per cent off list.

Warehouse Business.—Some sellers in this district report that present indications are that August will prove to be about 20 per cent better than July in volume of business, the increase being noteworthy in the tonnage of orders received. Sales of structural steel are in moderate volume and there is evidently a slight increase in demand for reinforcing bars. Black and galvanized sheets continue on about the same level, the greater strength being manifest in galvanized, while black shows an undertone of weakness. Demand for wrought iron and steel pipe is fair and discounts are fairly well maintained. We quote prices on page 494.

Finished Iron and Steel.—The volume of buying so far this month continues to be better than that of July. No forward purchasing of moment has yet developed, except among jobbers, who are replacing stocks. Wire nails are still sold at $2.85, with $2.80 the minimum for large lots, the price of $2.75 mentioned last week apparently being a dip granted in the case of a number of large purchases for warehouses. Fresh inquiries for structural steel show a further tapering off and in plate business the week has been notably dull. Mill operations indicate generally some expansion, but some concern is expressed that incoming volume will be sufficient to maintain the increased schedules.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.44c. to 2.49c.; plates, 2.04c. to 2.14c.; structural shapes, 2.34c. to 2.44c.; bar iron, 2.39c. to 2.44c.

Coke.—A slight tendency toward greater strength is noted, but distress tonnages are still available. While $4.25 to $5.25 is being quoted on standard foundry, $4 coke is often obtainable. Standard furnace is quotable at $3.25 to $3.50 per ton with very little available at lower prices. By-product is unchanged at $10.41, Newark and Jersey City, N. J.

Old Material.—The advance on heavy melting steel continues as brokers pay higher prices to bring out steel to ship on old contracts. Buying prices on No. 1 heavy melting steel, railroad quality, or equivalent, are $16.50 to $17 per ton delivered eastern Pennsylvania. Much of the steel being bought is going on contracts at $16 to $16.50 and even lower prices. One eastern Pennsylvania consumer has paid as high as $18, but later bought at $17.50 per ton, delivered. A Phoenixville consumer of borings and turnings is reported to have bought at $14 per ton. Consumers of specification pipe in Lebanon and Milton, Pa., are paying up to $16.50 per ton. Machine shop turnings and cast borings are bringing $13.50 per ton delivered to consumers in Harrisburg. Stove plate is being bought at $13.75 and $14.25 per ton, delivered to New Jersey foundries with a $2.02 freight rate.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$13.00 to $13.50
Heavy melting steel, railroad or equivalent	14.50 to 15.00
Rails for rolling	14.50 to 15.00
Relaying rails, nominal	24.00 to 25.00
Steel car axles	17.50 to 18.50
Iron car axles	25.00 to 26.00
No. 1 railroad wrought	14.50 to 15.00
Forge fire	8.75 to 9.25
No. 1 yard wrought, long	13.50 to 14.00
Cast borings (clean)	9.25 to 9.75
Machine-shop turnings	9.25 to 9.75
Mixed borings and turnings	7.50 to 8.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	12.25 to 12.75
Stove plate	12.00 to 12.50
Locomotive grate bars	11.50 to 12.50
Malleable cast (railroad)	14.00 to 14.50
Cast iron car wheels	14.50 to 15.00
No. 1 heavy breakable cast	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$15.00 to $15.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	13.00 to 13.50
No. 2 cast (radiators, cast boilers, etc.)	12.00 to 12.50

Conference on Steel Reinforcing Bars

WASHINGTON, Aug. 18.—A group of firms concerned with the manufacture and distribution of square and round steel reinforcing bars has submitted a proposal for the simplification of this commodity, and has requested the Division of Simplified Practice to call a general conference of all interests to consider the details, and, if possible, develop a unanimous simplified practice recommendation.

The conference will be held at 10 a. m., Eastern standard time, on Tuesday, Sept. 9, in Room 703, Commerce Building, Pennsylvania Avenue and Nineteenth Street, N. W., Washington. Two hundred representative men of all leading interests have been invited to be present.

A gondola car dumper is to be installed at Birmingham for the Sloss-Sheffield Steel & Iron Co., by the Link-Belt Co., Chicago. The machine will be required to dump gondola cars of coal up to a capacity of 100 tons at the rate of 20 per hr. It will be equipped with 19 hp. motor and built to require only one man to operate.

Cincinnati

Northern Pig Iron Shows More Strength with Melt Increasing

CINCINNATI, Aug. 19.—The Northern pig iron market is showing more strength, and this appears to be general. A southern Ohio furnace has advanced its price 50c. to $20, Ironton, following the receipt of a number of substantial orders, including one for 2000 tons, one for 700 and one for 600. This interest reports having already sold its August output and to have unfilled orders on hand to care for operations for some time. This condition, together with better shipments, accounts for the strength in the market. In Southern iron there is little change, although a sanitary ware manufacturer in this district is reported to have bought at least 6000 tons at $17.50, Birmingham. Part of this business was declined by some furnaces, which are holding for $18. On attractive tonnages $17.50 can be done, however, and we note one sale of 800 tons at this price. Silveries are still available at $1 below the last published schedule. There is no demand for basic or Bessemer grades. Generally inquiry is light, but melters are showing interest in the market, as the melt of pig iron in the district is gradually increasing.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern fdy., sil. 1.75 to 2.25 (base)	$21.55 to $22.05
Southern fdy., sil. 2.25 to 2.75	22.05 to 22.55
Southern Ohio silvery, 8 per cent	31.77
Southern Ohio fdy., sil. 1.75 to 2.25	21.77
Southern Ohio basic	21.27
Southern Ohio malleable	21.77

Sheets and Tin Plates.—The demand for sheets, particularly roofing sheets, is good at the present time, and jobbers report sales to date in August far exceeding expectations. Stock orders are in good volume. There is a fair demand for automobile body sheets, and it is reported in this connection that the price of 4.75c. no longer represents the minimum price at which orders will be taken. Auto body seconds are reported to have been sold at 4.90c., but this price cannot be confirmed. Demand for tin plate continues steady, an inquiry for 3000 base boxes being figured on. So far as reported there has been no shading of the $5.50 price. Reports are current of further shading of sheet prices, but the market generally can be quoted at 2.60c. for blue annealed, 3.40c. for black and 4.50c. for galvanized.

Structural Activity.—The Louisville & Nashville Railroad opens bids this week on two bridges involving 2300 tons of steel. It is expected competition will be keen for this business. The only award of importance was of 600 tons for an addition to the French Lick Hotel, which was taken by an Indianapolis fabricator. An unnamed project in Cincinnati will require about 1500 tons, and an office building at Huntington, W. Va., 300 tons.

Reinforcing Bars.—Awards of tonnages running less than 100 tons are in fair volume, but the only inquiry of importance is for a garage in Cincinnati, expected to require 400 tons. Prices are unchanged, the range being from 1.90c. for large tonnages of hard steel bars, to 2.15c., the price at which new billet stock is held by most mills.

Warehouse Business.—Jobbers of iron and steel products continue to report improvement in orders. This is especially true of roofing sheets. Reinforcing bars and small angles are moving fairly well, but the demand for cold-finished steel is rather quiet. Wire products are in slightly improved demand. Prices have not been changed, and are being firmly held.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled rounds, 4.05c.; cold-rolled flats, squares and hexagons, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, 4.60c.; No. 28 galvanized sheets, 5.75c.; No. 9 annealed wire, 3.30c.; common wire nails, $3.30 per keg base; cement coated nails, $3 per keg.

Finished Materials.—Demand continues to improve steadily, particularly for shapes and plates, and while there has been very little increase in manufacturing activities, buyers apparently are of the opinion that prices today are attractive enough to lay in a little stock, and are placing orders accordingly. A local sales agency reported that inquiries totaling nearly 20,000 tons have been figured on in the past week or two, most of the tonnage being shapes and plates. The largest inquiry now before the trade is for approximately 4000 tons of plates required for river boats which are to be built this fall and winter. Prices of shapes are being fairly well held at a range from 2c. to 2.10c., Pittsburgh, depending on the size and attractiveness of the order. The nominal quotation for plates is 2.15c., but attractive tonnages can be placed at less than 2c. On going business 2.15c. represents the bar market, but it is admitted that at least 2.10c. would be quoted on attractive inquiries. The demand for wire products is rather light, with prices unchanged at $2.80, mill, for wire nails, and $2.50 to $2.60 for plain wire. Low prices are reported on hoops, a manufacturer in this district having placed 200 tons at less than 2.40c. Prices of bolts and nuts have firmed up considerably, and 60 and 20 discount is now the lowest price heard of. It is said that further advances will be made for fourth quarter contracts.

Coke.—There is little activity in coke, though shipments on August contracts are running ahead of July. Prices are unchanged, but in some respects firmer, as operators are not willing to entertain present prices for the remainder of the year, and are quoting them only for shipment through third quarter.

Connellsville furnace, $3; foundry, $4.50; New River foundry, $8.50; Wise County furnace, $3.75; foundry, $4.50; by-product foundry, $6.50, Connellsville basis.

Old Material.—The demand for scrap is negligible, and trading between dealers has fallen off to practically nothing. Prices, however, are showing strength.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	$13.50 to $14.00
Scrap rails for melting	12.00 to 12.50
Short rails	17.00 to 17.50
Relaying rails	28.50 to 29.00
Rails for rolling	14.00 to 14.50
Old car wheels	13.00 to 13.50
No. 1 locomotive tires	14.00 to 14.50
Railroad malleable	15.50 to 16.00
Agricultural malleable	14.00 to 14.50
Loose sheet clippings	8.50 to 9.00
Champion bundled sheets	10.50 to 11.00
Per Net Ton	
Cast iron borings	9.50 to 10.00
Machine shop turnings	8.50 to 9.00
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	14.50 to 15.00
Iron axles	21.00 to 21.50
No. 1 railroad wrought	10.50 to 11.00
Pipes and flues	7.50 to 8.00
No. 1 busheling	9.50 to 10.00
Mixed busheling	7.00 to 7.50
Burnt cast	10.50 to 11.00
Stove plate	10.50 to 11.00
Brake shoes	11.50 to 12.00

Buffalo

Pig Iron Prices Somewhat Firmer, Especially as to the Higher Silicons

BUFFALO, Aug. 19.—The pig iron market gives evidence of some stiffening, though there has been no increase in the base price. One large producer has increased the differentials on high silicon foundry on the ground that it is scarce. This interest maintains a base of $19 with $19.50 for 2.25 to 2.75 silicon; $21 for 2.75 to 3.25 silicon and on 3.25 to 3.75, $21.50. Total inquiry for the week is 20,000 tons, and the principal lot sought is one of 4500 tons of foundry and malleable grades by the New York Air-Brake Co. A foundry in the East seeks to place 2000 tons and another inquiry is for 1300 tons. Several lots 500 tons, 600 tons and 750 tons are sought. A local maker took a part of the tonnage placed by an Eastern manufacturer of heating apparatus, who sought 5000 tons. The local maker took 2500 tons of this and 1600 tons of a 3600-ton inquiry put out by a specialty maker.

The Donner Steel Co. is planning increased iron production and it is expected that its second stack will be in blast by Aug. 25. This stack will be on foundry iron. A local producer has announced itself out of the market for the rest of the year delivery, except where unlooked-for capacity may be uncovered.

We quote prices per gross ton f.o.b. Buffalo as follows:

No. 2 plain, sil. 1.75 to 2.25	$19.00
No. 1 foundry, sil. 2.75 to 3.25	$20.00 to $ 21.00
No. 2 foundry, sil. 2.25 to 2.75	19.00 to 19.50

Finished Iron and Steel.—Most of the sellers have experienced another very fair week, following an equally good one before that. Jobbers are replenishing in almost every kind of steel and the fabricators are helping to make a brisker market in structural steel. Most of these apparently have plenty of work ahead and the demand for shapes has increased perceptibly. The shape price is generally 2.15c., though fabricators can probably get 2.10c. Bars are firm at 2.15c., with no extraordinary business noted and inquiries small. Wire shows an improvement. Some cases of 2.80c. being done on nails are heard. Sheet business is holding up with 3.50c. on black as the going price. Pipe business is featured by two inquiries for a total of 800 tons of line pipe for export to Peru. The demand for road-mesh continues with several hundred tons up for figures. Reinforcing bars are in good demand.

Steel bars, 3.30c.; iron bars, 3.35c.; reinforcing bars, 3.30c.; structural shapes, 3.40c.; plates, 3.40c.; No. 10 blue sheets, 4.05c.; No. 28 black sheets, 4.75c.; No. 28 galvanized sheets, 5.85c.; bands, 4.05c.; hoops, 4.40c.; cold finished rounds, 4.20c.; cold-finished shapes, 4.70c.

Old Material.—Mills are in a buying mood, but do not want to pay the prices that the sudden zest injected into the market by the dealers in a scramble for material have dictated. Mills want to buy heavy melting steel at $16.50 to $17, but this is a rather low price for real tonnage. Small lots can, and have been, bought at these prices, but dealers who have strictly No. 1 grade heavy melting steel, are holding out for $17.50. Low phosphorus interest is marked, but here, too, steel foundries, requiring this grade of scrap, do not want to pay the prices dealers are asking. Two of the foundries are particularly desirous of buying low phosphorus at what they consider a fair price. The market is somewhere around $18.50 to $19.50. Reports of coming increases in open-hearth operation are helping to give the market a firmer note and dealers are of the belief that the mills will eventually come to their figures. No. 1 cast is dull and until the foundry pig iron market moves more rapidly, probably will not be very active. One local buyer is offering $16.50, but dealers are holding out for $17 and in some cases $18. Stove plate is in much the same condition and collections are coming in slowly.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$16.50 to $17.50
Low phosphorus, 0.04 and under	18.50 to 19.00
No. 1 railroad wrought	15.00 to 15.50
Car wheels	17.50 to 18.00
Machine shop turnings	11.50 to 12.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	14.50 to 15.50
Stove plate	16.00 to 16.50
Grate bars	15.00 to 15.50
Bundled sheets	12.00 to 12.50
Hydraulic compressed	15.50 to 16.00
Railroad malleable	17.00 to 18.00
No. 1 machinery cast	17.00 to 18.00

The Navy Department has under consideration the sale of the "Victory Plant," Squantum, Mass., formerly operated by the Bethlehem Steel Co. through a subsidiary. The plant covers 35 acres, cost the Government more than $14,000,000, and is maintained at a cost of $100,000 per annum by the Government today. During the war approximately 10,000 were employed.

Railroad cars with concrete floors are to be built by the Astek G. m. b. H., Elizabethenstrasse 34, Darmstadt, Germany, a company incorporated to build the cars under patent rights of Professor Kleinlogel. One of the incorporators is Ludwig Alter, Darmstadt, formerly a manufacturer of furniture, whose factory will be utilized by the new company.

St. Louis

Pig Iron Prices Firmer—Increased Melt Reflected in Coke Market

ST. LOUIS, Aug. 18.—The chief feature in the pig iron situation is a gradual stiffening in prices, and somewhat more interest on the part of melters in supplies for last quarter. Sales actually closed have not been heavy, the total aggregating something under 3000 tons, but there is a fair volume of scattered inquiries from both steel makers and users of foundry iron. The melt has increased slightly since Aug. 1, and consensus of opinion is that the low point in this respect has been definitely left behind for this year. Of the pig iron sales reported the St. Louis Coke & Iron Co. accounted for 1500 tons, mainly in lots from 100 to 250 tons and all for prompt delivery. An Iowa foundry purchased 150 tons, and 200 tons went to a nearby Illinois specialty maker. More interest is being manifested in ferroalloys, sales of such material including 100 tons of ferromanganese and a similar tonnage of 12 to 13 per cent ferrosilicon. A local steel maker purchased 100 tons of 19 to 21 per cent spiegeleisen. The leading local blast furnace interest has advanced its quotation to $21.50 to $22, f.o.b. Granite City, and Northern iron is being firmly held at $20, furnace. Views of Southern makers have also stiffened during the past several days.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Florence and Sheffield (rail and water), $5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$21.16 to $21.56
Northern malleable, sil. 1.75 to 2.25	21.16 to 21.56
Basic	21.16
Southern fdy., sil. 1.75 to 2.25 (rail)	23.17 to 23.67
Southern fdy., sil. 1.75 to 2.25 (rail and water)	21.28 to 21.78
Granite City iron, sil. 1.75 to 2.25	21.81 to 22.31

Finished Iron and Steel.—Further improvement in the general buying activity has developed, and while separate orders are not of large size they are numerous and bulk well in the aggregate. Warehousemen are reporting the best current business in more than three months, and have begun replacement buying in order to fill out their assortments. Two Southwestern railroads were inquiring for sizable quantities of spikes and tie plates. Machine shops are purchasing more freely of all varieties of material. An Arkansas oil company closed on a round tonnage of tank plates, and has inquired for a corresponding quantity of bolts and rivets. Generally the demand from the oil fields continues active, though less urgent than 30 days ago. As has been the case for several months, fabricators are booking an excellent volume of small orders, but at the moment no large contracts are before them. The demand for road building materials continues brisk, and in the immediate past was stimulated by the letting of several sizable contracts by the Missouri Highway Commission.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 5c.; cold rolled rounds, shafting and screw stock, 4.15c.; structural rivets, 3.90c.; boiler rivets, 4.10c.; tank rivets, ⅞-in. and smaller, 60 per cent off list; machine bolts, 55 and 5 per cent; carriage bolts, 40 and 5 per cent; lag screws, 60 and 5 per cent; hot pressed nuts, squares or hexagons, blank or tapped, $3.50 off list.

Coke.—The increased melt of iron is being reflected in a fair volume of sales of foundry coke, chiefly in small lots for prompt shipment. Almost 100 per cent of this business is going to the by-product manufacturers, demands upon the Eastern and Southern beehive ovens being next to nothing. Little, if any, improvement has taken place in the domestic coke situation, ordering by both dealers and householders being largely under normal for this particular season. Some contracting by industrial users has been reported during the past two weeks, but not in volume sufficient to change the dull aspect of the market. Stocks on by-

product yards are liberal, and in some notable instances are continuing to increase. Prices were unchanged.

Old Material.—Values throughout the list continue strong, with several further advances recorded. Rails for rolling, which are scarce and in good demand, were raised 50c. per ton, and higher quotations were made on steel splice bars, car wheels and iron car axles. The industries are in need of scrap, particularly the steel mills, and they have been quietly looking about for bargains. Dealers are very firm in their views, and are predicting substantially higher prices by the end of September. Not much scrap is coming in sight. Prices and freight rates continue to militate against shipments from country points, and the railroads are too preoccupied with moving the crops to market their accumulations. The only lists put forth by the carriers were 2600 tons by the Rock Island, 500 tons by the Frisco and 100 tons by the New Orleans & Great Northern.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails	$12.00 to $12.50
Rails for rolling	17.50 to 18.00
Steel rails less than 3 ft.	18.50 to 19.00
Relaying rails, 60 lb. and under	25.00 to 26.00
Relaying rails, 70 lb. and over	32.50 to 33.50
Cast iron car wheels	16.50 to 17.00
Heavy melting steel	15.00 to 15.50
Heavy shoveling steel	14.50 to 15.00
Frogs, switches and guards cut apart	16.50 to 17.00
Railroad springs	20.00 to 20.50
Heavy axles and tire turnings	11.50 to 12.00
No. 1 locomotive tires	17.00 to 17.50
Per Net Ton	
Steel angle bars	17.50 to 18.00
Steel car axles	18.00 to 18.50
Iron car axles	22.75 to 23.25
Wrought iron bars and transoms	17.00 to 17.50
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	13.25 to 13.75
Cast iron borings	9.25 to 9.75
No. 1 busheling	11.50 to 12.00
No. 1 railroad cast	17.00 to 17.50
No. 1 machinery cast	17.50 to 18.00
Railroad malleable	14.00 to 14.50
Machine shop turnings	7.00 to 7.50
Champion bundled sheets	7.50 to 8.00

Birmingham

Pig Iron Market Lags—Pipe Outlook Reported Improved

BIRMINGHAM, ALA., Aug. 19.—A little more lagging characterizes the Southern pig iron market, sales recently not being so numerous and business being in small lots. Inquiries have been steady but there has not been much consummation. The total business the past week was under the make and the blowing out of another blast furnace is looked for this week. On a round tonnage $17.50 is possible on No. 2 foundry and some selling has been done at that price this month. The average price, though, is $18 per ton, No. 2 foundry. A little iron is being shipped from the furnace at Sheffield, on the Tennessee River, into the St. Louis and Chicago territories. Despite the quietness of the market, furnace interests here manifest confidence of an early recovery. Local consumption of pig iron has shown no inclination to speed up recently.

We quote per gross ton, f.o.b. Birmingham district furnace as follows:

No. 2 foundry, 1.75 to 2.25 sil.	$17.50 to $18.00
No. 1 foundry, 2.25 to 2.75 sil.	18.00 to 18.50
Basic	18.50 to 19.00
Charcoal, warm blast	31.00

Cast Iron Pipe.—While lettings are still coming in steadily for gas and water cast iron pipe, the soil pipe trade has not shown much improvement even with a $5 per ton reduction in quotations. The gas and water pipe companies announce that there is a better outlook for business than any time within the past six months. The quotations of soil pipe are reported weak with probabilities of further recession.

Steel.—Some little improvement is noted in the steel trade with the subsidiary companies of the Steel Corporation and reports are current that there will be steady operation with the several plants through the rest of the year. Steel bars are quoted 2.30c., Birmingham.

Coke.—Production of coke in Alabama is off again, upward of 100 beehive ovens having been closed down. Another curtailment in by-product coke ovens is also under consideration. Demand for coke is slow. Quotations show no change, ranging from $4.50 to $5.50 per ton. Alabama By-Products Corporation, Morris Bush, president, will begin work at once on building another addition, one-third the size of the present plant, the work to be completed within eight months. Coke production will be increased to 1350 tons daily or 40,500 monthly, while benzol output will be around 130,000 gal. monthly. All the gas from this plant is used for manufacturing purposes in the Birmingham district.

Scrap.—The steels in the scrap iron and steel market show considerable activity, compared with conditions which have existed for the past several weeks, an advance of $1.50 per ton being noted in heavy melting steel and old steel rails quotations. The iron or cast scraps are slow because of the lagging pig iron market. Dealers in old material continue buying in stock to the limit of their activity and the yards will be kept in fine shape.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Cast iron borings, chemical	$15.00 to $16.00
Heavy melting steel	12.50 to 13.00
Railroad wrought	12.00 to 13.00
Steel axles	17.00 to 18.00
Iron axles	19.00 to 19.50
Steel rails	12.50 to 13.00
No. 1 cast	15.00 to 16.00
Tram car wheels	15.00 to 16.00
Car wheels	14.00 to 15.00
Stove plate	14.00 to 15.00
Machine shop turnings	6.00 to 7.00
Cast iron borings	7.00 to 8.00
Rails for rolling	15.00 to 16.00

Boston

Eastern Pennsylvania and Buffalo Iron Prices Appear Firmer

BOSTON, Aug. 19.—Prices for eastern Pennsylvania and Buffalo irons appear firmer. Eastern Pennsylvania at $20 a ton furnace base has disappeared, and it is doubtful if $20.50 would be accepted on small tonnages today. Buffalo silicon 1.75 to 2.25 is unchanged at $19, furnace, but No. 2X heretofore $19 and No. 1X heretofore $19.50, are now $19.50 and $20, respectively, for fourth quarter shipment. No. 1X for August and September shipment is firm at $21. Sales the past week included 500 tons of malleable and 100 tons of silicon 4.25 to 4.75 to a Worcester, Mass., foundry at $19 and $19.50, respectively, by a New York furnace; 500 tons of No. 2X Buffalo and a similar amount of New York iron to a Massachusetts foundry at $19 furnace; 1200 tons of No. 1X and 400 tons of No. 2X New York iron to a Providence, R. I., foundry, price details regarding which are withheld; 300 tons of No. 1X New York at $21.25 furnace to a Massachusetts melter; and numerous small tonnages of Buffalo, eastern Pennsylvania and New York irons, mostly for fourth quarter shipment. In the week ending Aug. 16, 450 tons of India iron was received at this port.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia and $9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25	$24.15 to $25.15
East. Penn., sil. 2.25 to 2.75	24.65 to 25.15
Buffalo, sil. 1.75 to 2.25	23.91
Buffalo, sil. 2.25 to 2.75	24.41
Virginia, sil. 2.25 to 2.75	29.92 to 31.92
Alabama, sil. 1.75 to 2.25	27.10 to 27.60

Coke.—Although the weekly melt of iron in New England has not increased to any appreciable extent, foundries are specifying against coke contracts a little more freely. There is no disposition to stock up for the winter, however. Most of the large coke users have cut coke purchases to a minimum. Current takings, therefore, are by the smaller foundries. Both the New England Coal & Coke Co. and the Providence Gas Co. quotes by-product foundry coke at $11.50 a ton delivered in New England. Interest in cokes made outside New England is very slight.

Warehouse Business.—The demand for iron, steel, bolts and nuts is slowly expanding, but is far from brisk. Warehouse stocks are comfortably large and well assorted. Reports of an advance in bolts and nuts from Pittsburgh have not been confirmed in this market. Some bolt and nut makers have withdrawn prices, and others will accept only small orders on present list quotations.

Soft steel bars, \$3.26½ base per 100 lb.; flats, \$4.15; concrete bars, \$3.51½ to \$3.64; structural steel, \$3.36½; tire steel, \$4.50 to \$4.75; open-hearth spring steel, \$5 to \$10; crucible spring steel, \$12; steel bands, \$4.01½ to \$5; hoop steel, \$5.50 to \$6; cold rolled steel, \$4.15 to \$4.65; toe calk steel, \$6; refined iron bars, \$3.26½; best refined bars, \$4.60; Wayne, \$5.50; Norway, \$6.60 to \$7.10; plates, ¼-in. and heavier, \$3.36½; No. 10 blue annealed sheets, \$4.16½; galvanized sheets, \$6 base; black sheets, \$5 base.

Old Material.—Old material prices are strong, but there is comparatively little scrap moving due to the tendency of owners to wait for a still further appreciation in values. Small lots of heavy melting steel are moving at \$12 to \$12.50 for shipment to a Worcester, Mass., and a Rhode Island steel mill, takings for these two accounts during the past two or three weeks aggregating approximately 1600 tons. For eastern Pennsylvania shipment, \$11.50 a ton on cars is being paid for steel. Horseshoes are in demand and scarce at \$19 to \$20 delivered in New England. The Standard Horseshoe Co., Boston, is in the market for yard wrought. Brokers with orders for rails for rerolling and for shafting report difficulty in securing material. Prices on No. 1 machinery cast are uncertain. Sales of textile machinery at or about \$20 a ton delivered are noted. On the other hand, a textile mill sold scrap direct to a foundry at \$18.25 a ton. Bids will be received by the Boston & Maine Railroad until Aug. 22 on 78 miscellaneous cars of old material.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	\$19.50 to \$20.00
No. 2 machinery cast	16.50 to 17.00
Stove plates	15.00 to 15.50
Railroad malleable	17.00 to 17.50

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	\$11.50 to \$11.75
No. 1 railroad wrought	13.50 to 14.00
No. 1 yard wrought	12.50 to 13.00
Wrought pipe (1-in. in diam., over 2 ft. long)	11.50 to 12.00
Machine shop turnings	8.50 to 9.00
Cast iron borings, chemical	10.00 to 10.50
Cast iron borings, rolling mill	8.50 to 9.00
Blast furnace borings and turnings	7.50 to 8.00
Forged scrap and bundled skeleton	8.50 to 9.50
Shafting	18.50 to 19.00
Street car axles	18.50 to 19.00
Rails for rolling	13.50 to 14.00

Detroit Scrap Market

DETROIT, Aug. 19.—In spite of the small number of blast furnaces now operating, prices continue strong on borings, short turnings and busheling scrap, which are largely limited to this avenue of distribution. Automobile cast is not plentiful and, while the lighter grades are obtainable at the prices listed, cylinder blocks and other heavy material are higher, dealers asking up to \$20. Interest is centered in some important lettings later in the month, the expectation being that somewhat higher prices will be secured.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	\$14.50 to \$15.50
Shoveling steel	13.00 to 14.00
Borings	12.00 to 13.00
Short turnings	12.00 to 13.00
Long turnings	10.00 to 11.00
No. 1 machinery cast	15.50 to 17.00
Automobile cast	17.50 to 18.50
Hydraulic compressed	11.50 to 12.75
Stove plate	13.50 to 14.50
No. 1 busheling	12.00 to 13.00
Sheet clippings	8.00 to 9.00
Flashings	10.50 to 11.50

Outstanding features of its rapid traverse planers are set forth in a 15-page booklet recently issued by the Cincinnati Planer Co., Cincinnati. Illustrations, which are unusually large and clear, include full views of the machines, as well as component details.

Cleveland

Some Sellers Advance Pig Iron Prices—Improvement in Sheets

CLEVELAND, Aug. 19.—The volume of business in finished iron and steel during the past week was about the same as during the previous week, but more hesitancy appeared to develop among buyers over placing orders because of their fear that prices may go lower. On the whole, the price situation is hardly as firm as a week ago. Consumers in some lines are getting a little busier and consequently are consuming more steel, which, as a rule, they are buying only for early requirements. Some inquiries for round lots of steel bars and for fourth quarter contracts are pending, but some buyers are undecided whether to place the orders or to wait until prices become more stable. On steel bars 2.15c. is still the open market price and while leading producers are holding firmly to this price, reports are becoming more common that bars can be bought at 2.10c., and some buyers claim to have a 2.05c. quotation. Structural material lacks firmness with fair-sized lots bringing out a 2.10c. price and small lots going at 2.15c. Plates have generally settled down to a 2c. base with little attempt to secure a higher price for a small lot and some sales are being made at 1.90c. Hot-rolled strip steel continues irregular, with quotations ranging from 2.15c. to 2.40c. for wide material, and hoops are quoted around 2.60c. Cold-rolled strip steel ranges from 4c. to 4.25c. The demand for hot-rolled strip steel has improved both from cold rolling mills and from other consumers, largely in the automotive field. There is a lull in new inquiries in the structural field, but a fair amount of work is pending in recent inquiries and in other work not yet out for figures.

Jobbers quote steel bars, 3.11c.; plates and structural shapes, 3.21c.; No. 28 black sheets, 4.35c.; No. 28 galvanized sheets, 5.45c.; No. 10 blue annealed sheets, 3.45c. to 3.76c.; cold-rolled rounds, 4c.; flats, squares and hexagons, 4.50c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 3.86c.; narrower than 1 in. or lighter than No. 20 gage, 4.36c.; No. 9 annealed wire, \$3.30 per 100 lb.; No. 9 galvanized wire, \$3.75 per 100 lb.; common wire nails, \$3.40 base per 100 lb.

Pig Iron.—Indications of a firmer market that have appeared for the past two or three weeks have been followed by a 50c. price advance on foundry and malleable iron by two leading producers in this territory having Lake and Valley furnaces. A third producer announced a similar price advance a week ago. One Cleveland producer has not yet advanced, being still on the \$19 basis for outside shipment, but will probably join in the advance. While the \$19 price has not disappeared in Cleveland or the Valley district, an \$18.50 price that has come out now and then probably can no longer be found. One Valley furnace is now holding foundry and malleable iron at \$20, having previously been on the \$19.50 basis, and reports sales at the advance, although \$19.50 is still the more common Valley price. Other producers have made several sales since they marked their price up to \$19.50. For Cleveland delivery the prices are unchanged at \$20 at furnace. In Michigan the market is up 50c. to \$19.50, although one interest is now asking \$20, Detroit. A fair volume of business was booked during the week, although sales in the aggregate were not so heavy as during the previous week. A nearby consumer bought 1000 tons of foundry iron at \$20, Cleveland. A Pittsburgh district sanitary ware manufacturer has purchased 2000 tons of foundry iron from a Cleveland interest and is inquiring for 2000 tons of Southern foundry iron. A Toledo melter bought 500 tons of malleable iron from an outside furnace at \$19.50. Inquiries include one for 2000 tons of foundry iron from a Michigan consumer. No new business is coming from the automobile field, but car builders during the week released some iron on old contracts. An inquiry developed for 3000 tons of basic iron for Alliance and it is understood that this was placed with a nearby furnace. Ohio silvery iron is irregular, with a concession of about \$1.50 per ton from the regular schedule. A Cleveland consumer placed a

500-ton lot. The McKinney Steel Co. placed its No. 1 River furnace in blast Monday. This furnace has been rebuilt.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$19.00
N'th'n No. 2 fdy., sil. 1.75 to 2.25	20.50
Southern fdy., sil. 1.75 to 2.25	$23.50 to 24.00
Malleable	20.50
Ohio silvery, 8 per cent	33.52
Stand. low phos., Valley furnace	27.50 to 28.00

Bolts, Nuts and Rivets.—Prices have stiffened and there appears to be little, if any, shading of the 60 and 20 per cent discount on large machine bolts. The demand continues to show a gain over last month. The demand for rivets which had been very slow has improved materially. The market has become firmer and most makers are now holding to 2.60c. for large rivets.

Semi-Finished Steel.—No sales are reported, but some activity in sheet bars is expected shortly, as some consumers are getting their second quarter contracts used up. Slabs were quoted to a local consumer during the week at about $38.50, delivered, or $35, shipping point. A local producer is still holding to $38 for sheet bars, billets and slabs.

Reinforcing Bars.—The demand for small lots continues good. The Concrete Reinforcing & Engineering Co. has taken 275 tons for the Moreland Court apartments, Cleveland. Inquiries include 150 tons for the Cleveland Illuminating Co.'s power house and an unnamed tonnage for the University School Building, Cleveland. Prices are unchanged at 1.90c. to 2c. for rail steel bars and 2.10c. to 2.15c. for billet steel bars.

Sheets.—Orders show some improvement and there is marked evidence of strength in the market, as leading mills appear to be holding firmly to 3.50c. for black, 4.60c. for galvanized and 2.65c. to 2.70c. for blue annealed sheets. However, smaller mills in need of tonnage appear to be still making sharp concessions on round lots of black sheets and the sale of a 1000-ton lot is reported at 3.30c.

Coke.—The foundry coke market is quiet, with prices unchanged at $4.25 to $5.50 for standard Connellsville makes. Sales of better grades of Wise County foundry coke are reported at $5.25 to $5.50.

Old Material.—The scrap market is pretty nearly at a standstill. Mills are not actively in the market and are unwilling to pay prices held by dealers, and no real test of the market developed during the week. Most dealers have large stocks on which they would not make much profit if sold even at present prices. Consequently they are not trying to force sales. Yard stocks are now so large that it is believed that dealers will not do much more speculative buying. The narrow spread between scrap and pig iron has caused some foundries in this territory to buy pig iron after getting quotations on scrap. Prices are unchanged from a week ago.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$15.00 to $15.50
Rails for rolling	15.75 to 16.00
Rails under 3 ft.	16.25 to 16.75
Low phosphorus melting	17.50 to 17.75
Cast iron borings	14.00 to 14.50
Machine shop turnings	13.00 to 13.25
Mixed borings and short turnings	13.25 to 13.75
Compressed sheet steel	13.25 to 13.50
Railroad wrought	12.75 to 13.00
Railroad malleable	17.00 to 17.50
Light bundled sheet stampings	12.00 to 12.50
Steel axle turnings	13.25 to 13.50
No. 1 cast	18.00 to 18.25
No. 1 busheling	12.75 to 13.00
Drop forge flashings	13.25 to 13.50
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	11.00 to 11.25

Iron Ore.—Ore shipments for August are expected to be around 7,000,000 tons, or slightly less than in July. A sharp curtailment in the Lake movement is looked for in September, as several of the ore firms are fully a month ahead on shipping schedules. Late estimates are that the season's movement will not exceed 40,000,000.

Ore Consumption.—With only 118 furnaces using Lake Superior ore in blast July 31, as compared with 131 on June 30, consumption of Lake ore fell off 377,000 tons during July. Ore on hand at furnaces and Lake Erie docks increased over 5,000,000 tons during the month and amounted to 31,595,562 tons Aug. 1. On the same date a year ago furnace and dock stocks amounted to 27,503,482 tons.

Philadelphia

Improvement in Business Continues in Moderate Way—Pig Iron and Scrap Higher

PHILADELPHIA, Aug. 19.—The trend of the Eastern iron and steel market bears out the observation in this column in mid-July that there would be a "steady but slow improvement from now on." Each week has brought an increase in orders for nearly all lines of finished steel, but it has been slight, and has not been accompanied by any strength in prices. In scrap, however, which sometimes is credited with pointing the way toward business recovery, there has been a decided gain as to both volume of buying and prices. Pig iron has not yet shared the strength of scrap, but the market is firmer, and while not active, a fair volume of buying, particularly for fourth quarter, has been in progress during the past few weeks.

The possibility that the United States Steel Corporation may follow the order of the Federal Trade Commission to desist from quoting uniformly from all of its subsidiary mills on a Pittsburgh basis has brought no change in the methods of quoting by Eastern mills, most of whose representatives say that they will continue to quote on a Pittsburgh base because Pittsburgh mills are their chief competition. The Pencoyd mill of the American Bridge Co., which sells plain material through the Carnegie Steel Co., has for some time quoted on a mill basis, and the Eastern Steel Co. had adopted this plan of quoting in most instances even before the Federal Trade Commission order was issued. However, the Bethlehem Steel Co., the Phoenix Steel Co. and all of the Eastern plate mills are quoting as formerly, which means a delivered price, with freight allowed, although such prices are figured on a Pittsburgh basis.

Pig Iron.—Without any pronounced activity, the pig iron market has become slightly firmer, there being less inclination to shade prices, which are now pretty firmly established on a $20.50 base for foundry iron. One company, which has sold 20,000 tons since the first of the month, has taken only one order at less than the $20.50 base, and that was entered in the first week of the month. Such concessions as are being made are usually to meet competition of furnaces having a lower freight rate to the point of shipment. The furnace company having the lowest freight rate to Philadelphia is firmly on the $20.50 base, with 50c. differentials for iron containing the higher grades of silicon, and it appears certain that the lowest Philadelphia delivered prices on foundry iron are now $21.26 for No. 2 plain and $21.76 for No. 2X, an advance of 50c. a ton from the quotations published for some weeks. No basic iron transactions have taken place since the recent purchase of 25,000 tons by an Eastern steel company. Details of this transaction, as now disclosed, are that one company will furnish 17,500 tons, another 2500 tons, and 5000 tons will come from India. The Virginia pig iron market, long inactive, has been enlivened by inquiries from cast iron pipe companies for 6000 to 8000 tons. A singular circumstance, however, is that Birmingham iron can be delivered to the inquiring companies at less than Virginia makers appear willing to quote. The situation in Virginia in the past few weeks, when all furnaces have been idle, will be changed this week with the blowing in of a Low Moor stack which went out for repairs. Virginia iron is quoted from $23 to $24,

base, but at this level scarcely any is being sold in the Philadelphia territory. Low phosphorus iron is not active and prices remain unchanged.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76c. to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$21.26 to $22.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.76 to 22.63
East. Pa. No. 1X	22.26 to 23.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.17 to 28.67
Virginia No. 2X, 2.25 to 2.75 sil.	28.67 to 29.17
Basic delivered eastern Pa.	20.00 to 21.00
Gray forge	21.00 to 22.00
Malleable	22.00 to 22.50
Standard low phos. (f.o.b. furnace)	24.00 to 25.00
Copper bearing low phos. (f.o.b. furnace)	24.00 to 25.00

Ferroalloys.—American agents for British makers of ferromanganese have received notice of a reduction in the price of the British alloy to $95, delivered Atlantic ports, duty paid. Sellers here have been advised by some of their customers that they have received offers of ferromanganese at less than this price, but whether this is resale material had not been determined. Offers of 50 per cent ferrosilicon are still being made at $68, delivered, but the quotations of some of the larger makers are higher.

Track Material.—The Pennsylvania Railroad has issued an inquiry for 600 tons of tie plates. It has also been buying a fair quantity of spikes.

Plates.—Eastern plate mills are able to report a continued improvement in business, but no improvement in prices. Small lots are being quoted at 1.80c., Pittsburgh, but larger lots are being taken at 1.75c. Although hopeful that the improved condition of business may bring some strength in prices, the mills see no signs of such strength as yet. The most hopeful indication is that buyers are willing, and in some instances anxious, to contract for the remainder of the year at 1.75c. One company is giving such coverage in a limited way to regular customers. Its understanding with buyers is that in the event of an advance in prices they will be covered only on commitments on which they can furnish specifications. No large plate tonnages are pending except the 3000 tons inquired for by the Cramp shipyard for a boat which has not yet been contracted for. The 10,000 or 12,000 tons of steel required for 1000 cars for the Chesapeake & Ohio Railroad will probably go to a Chicago mill, as did a former car tonnage, this giving the railroad the entire haul on the material. The Lukens mill has put on another open-hearth furnace, making about a 50 per cent operation in the steel department, and a slightly better rate in the finishing department due to the fact that "cold steel" is still being used. Some of the smaller mills are operating at this rate or better.

Structural Material.—Orders from fabricators and jobbers continue to come to Eastern mills at a very fair rate, and operations probably average 60 per cent or more. One of the smaller mills is operating at its fullest, another is running about 75 per cent. Most of the larger jobs in this district having recently been settled, new projects are mostly of small size. Prices continue to show some variation, ranging from 2.20c., mill, in two instances to 2.10c., Pittsburgh. The latter price quoted in some cases by Pittsburgh mills is too high to result in much business. Many of the current quotations range from 2.26c. to 2.32c., Philadelphia.

Bars.—Bars continue to present a stronger front as regards prices than most other rolled products. The leading producers are firm at 2.15c., Pittsburgh, although a sale of angles is reported at 2.10c. The demand for bars has shown a slow but steady increase in recent weeks. Bar iron is quiet, but the demand is slightly improved. Prices are 2.05c. to 2.10c., Pittsburgh.

Sheets.—Some of the weakness recently apparent in the sheet market has disappeared. Galvanized sheets are now firm at 4.60c., Pittsburgh, while black sheets are in nearly all instances being sold at 3.50c. and a majority of the transactions in blue annealed are at 2.70c., Pittsburgh.

Tin Plate.—Stock tin plate is being offered at $4.90 to $5.15 per base box, according to sizes. Production plate remains firm at $5.50.

Strip Steel.—Some of the wider sizes of hot-rolled strip are being sold at 2.40c., Pittsburgh, while narrow sizes continue at 2.50c. to 2.60c. Cold-rolled strip is quoted from 4.25c. to 4.50c., Pittsburgh.

Bolts.—Some of the Eastern makers of bolts have taken a firmer stand on prices and are now quoting nothing less than 60 and 20 per cent off on large machine bolts and corresponding prices on other styles and sizes.

Warehouse Business.—Prices continue as quoted a week ago, for local delivery, being as follows:

Soft steel bars and small shapes, 3.22c.; iron bars (except bands), 3.22c.; round edge iron, 3.50c.; round edge steel, iron finished, 1½ x ½ in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, ¼ in. and heavier, 3.32c.; tank steel plates, ⅛ in., 3.47c.; blue annealed steel sheets, No. 10 gage, 3.75c.; black sheets, No. 28 gage, 4.75c.; galvanized sheets, No. 28 gage, 5.85c.; square twisted and deformed steel bars, 3.22c.; structural shapes, 3.32c.; diamond pattern plates, ¼-in., 5.30c.; ⅛-in., 5.50c.; spring steel, 5c.; round cold-rolled steel, 4.15c.; squares and hexagons, cold-rolled steel, 4.65c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.10c.; narrower than 1 in., all gages, 4.60c.; steel bands, No. 12 gage to ⅛ in., inclusive, 3.97c.; rails, 3.35c.; tool steel, 8.50c.; Norway iron, 7c.

Billets.—Demand for billets has increased slightly. While a sale of 750 tons of rerolling billets is reported at $38, Pittsburgh, it is stated that this price has been shaded at least 50c. a ton in a few instances. Forging billets have been sold at $42, a decline of $1.

Imports.—Imports of the past week at the port of Philadelphia included the following: 1990 tons of manganese ore from British India; 7800 tons of iron ore from French Africa; 7523 tons of iron ore from Sweden; 424 tons of structural steel from Belgium.

Old Material.—The rapid rise in scrap prices has created more or less consternation among both consumers and dealers. Some of the larger brokers are considerably short on orders taken a few weeks ago at prices $1 a ton or more below today's level, and there has been a scurrying to cover on these orders even at a substantial loss. An Eastern steel company has bought about 15,000 tons of heavy melting steel in the past week at $17, $17.50 and $18, and this has forced the Eastern market up practically on a level with Pittsburgh, and it is obvious that further advances here are unlikely until the Pittsburgh market has shown greater strength. The advance in the East has not been confined to steel grades, almost every item consumed in this district showing substantial increases. A much better volume of buying of all grades has brought this about in a natural way. On old orders dealers are offering $16.50 for steel scrap for delivery to several mills and $17 for delivery at another point.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$17.00 to $18.00
Scrap rails	17.00 to 18.00
Steel rails for rolling	19.00 to 19.50
No. 1 low phos., heavy 0.04 and under	21.00 to 21.50
Couplers and knuckles	20.00 to 21.00
Rolled steel wheels	20.00 to 21.00
Cast-iron car wheels	18.00 to 18.50
No. 1 railroad wrought	19.50 to 20.50
No. 1 yard wrought	17.00 to 17.50
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.00 to 14.50
Mixed borings and turnings (for blast furnace use)	12.50 to 13.00
Machine shop turnings (for steel works use)	14.00 to 14.50
Machine shop turnings (for rolling mill use)	14.00 to 14.50
Heavy axle turnings (or equivalent)	16.50 to 17.00
Cast borings (for steel works and rolling mills)	14.00 to 14.50
Cast borings (for chemical plants)	15.00 to 15.50
No. 1 cast	19.00 to 20.00
Heavy breakable cast (for steel plants)	17.00 to 17.50
Railroad grate bars	15.50 to 16.00
Stove plate (for steel plant use)	15.50 to 16.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	25.00 to 25.50
Steel axles	24.00 to 25.00

STRUCTURAL STEEL IN JULY

Bookings 6 Per Cent Better Than in June—High Month in Shipments

WASHINGTON, Aug. 18.—The Department of Commerce announces sales of fabricated structural steel for July, based on figures received from the principal fabricators, as 70 per cent of capacity, with total bookings of 165,240 tons reported by firms with a capacity of 236,345 tons per month. Shipments of firms reporting this item represented 82 per cent of capacity, as against 77 per cent in June.

The table below lists the statistics reported by 189 identical firms (including data in earlier months for seven firms out of business), with a present capacity of 245,990 tons per month, comparing with 249,540 in 1923. For comparative purposes, the percentage figures are prorated to obtain an estimated total for the United States, based on a capacity of 260,000 tons per month.

	Actual Tonnage	Per Cent of Capacity	Computed Tonnage
1923			
January	179,337	72	187,200
February	192,270	77	200,200
March	229,733	92	239,200
April	193,639	78	202,800
May	140,558	56	145,600
June	125,531	50	130,000
July	125,105	50	130,000
August	143,402	57	148,200
September	129,999	52	135,200
October	121,298	49	127,400
November	132,666	54	140,400
December	195,607	80	208,000
1924			
January	175,639	72	187,200
February	179,866	73	189,800
March	174,465	71	184,600
April	159,254	65	169,000
May	145,430	59	153,400
June	[1] 161,182	66	171,600
July	[2] 165,240	70	182,000

[1] Reported by 184 firms with a capacity of 244,615 tons.
[2] Reported by 161 firms with a capacity of 236,345 tons.

Falling Off in Both Awards and Fresh Inquiries for Structural Steel

Bookings of fabricated structural steel for the past week call for 16,000 tons, or about 60 per cent of the recent weekly average. A falling off is noted also in fresh inquiries, this week's list calling for about 14,000, or one-half of the average of recent weeks. The awards include:

Municipal building, White Plains, N. Y., 300 tons, to the Taylor-Fichter Steel Construction Co.

Apartment houses at Seventy-second Street and West End Avenue, 900 tons; 105th Street and West End Avenue, 1000 tons, and Seventy-seventh Street and West End Avenue, 1400 tons, all to the Paterson Bridge Co.

Community building, New York, for the Gould Foundation, 300 tons, to the Porcupine Co., Bridgeport, Conn.

Merchant's Market, Newark, N. J., group of buildings, 700 tons, to the Hedden Iron Construction Co.

Consolidated Gas Co., Bronx Borough, New York, 200 tons, to Post & McCord.

Rutgers Presbyterian Church, 600 tons, to the Harris Structural Steel Co.

Seaboard Air Line, two bridges, 400 tons, to the American Bridge Co.

Western Electric Co., Bethune Street addition, New York, 1400 tons, to the Hay Foundry & Iron Works.

Pennsylvania Railroad, York Street bridge, Philadelphia, 340 tons, to McClintic-Marshall Co.

St. Augustine's school and convent, New York, 200 tons, to Lehigh Structural Steel Co.

First National Bank Building, Youngstown, Ohio, 1500 tons, to McClintic-Marshall Co.

New York Central Lines, West, 500 tons of bridge material, to McClintic-Marshall Co.

Standard Oil Co. of New Jersey, warehouse, 1200 tons, to McClintic-Marshall Co.

Allen Hospital, Oberlin College, Oberlin, Ohio, 100 tons, to Jones & Laughlin Steel Corporation.

Phoenix Utility Co., Hawley, N. Y., surge tank, 600 tons, to Chicago Bridge & Iron Works.

Rawson Clinical Laboratories, laboratory building, Chicago, 512 tons, to American Bridge Co.

Bridge, Carter County, Mo., 450 tons, to Kansas City Structural Steel Co.

Addition to hotel, French Lick, Ind., 400 tons, to Hetherington & Berner.

By-Products Coke Corporation, boiler house and conveyor structure, South Chicago, Ill., 375 tons, to American Bridge Co.

Three 192-ft. truss spans over Colorado River, Fayette County, Tex., near Bastrop, 324 tons, to Kansas City Structural Steel Co.

Birtman Electric Co., plant, Chicago, 300 tons, to A. Bolters' Sons.

Atchison, Topeka & Santa Fe, ice plant, Winslow, Ariz., 250 tons, to Union Iron Works, San Francisco.

Union Market Building, St. Louis, 250 tons, to Spuck Iron & Foundry Co.

Two buildings in Omaha, Neb., 205 tons, to Paxton-Vierling Iron Works.

Bridge over Cross Lake, near Shreveport, La., 149 tons, to American Bridge Co.

Headframes for Pickands, Mather & Co., at Duluth, Minn., 200 tons, to Lakeside Bridge & Steel Co.

Bridge for City of Lansing, Mich., 200 tons, to Wisconsin Bridge & Iron Co.

Memorial Building for Hibbing, Minn., 260 tons, to Lakeside Bridge & Steel Co.

Gas holder at Talladega, Ala., with purifiers, 200 tons, to Stacey Mfg. Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Narragansett Electric Light Co., power house addition, Providence, R. I., 700 tons.

Philadelphia, school building, 150 tons of structural and 300 tons of reinforcing bars.

Boston Five Cent Savings Bank, Boston, 1360 tons, and not 1100, as previously reported.

Boiler house extension, Providence Gas Co., Providence, R. I., 1000 tons.

Standard Club, Chicago, bids on revised plans to be received this week, 2800 tons.

Plankinton Hotel addition, Milwaukee, 2500 tons.

Illinois Women's Athletic Club, Chicago, 2100 tons. Bids in.

United States Engineer's Office, three dredge hulls for Middle West rivers, 1500 tons.

State highway bridge, Nebraska, 800 tons.

New York Central Railroad, shop building,, Elkhart, Ind., 550 tons.

Kansas City Southern Railway, bridge, 300 tons.

Rock Island Lines, two bridges, 200 tons.

Bridge in Arkansas, 200 tons.

Grand stand at race track being built near Cincinnati, 900 tons.

Office building, Huntington, W. Va., 300 tons.

RAILROAD EQUIPMENT BUYING

Fresh Buying on Good Scale Expected of Western Roads

The chief development in the railroad equipment field is the appearance of a large inquiry from the Illinois Central. All with this are reports of the early entering of the car market by other Western roads, as the following items indicate:

The Illinois Central, in addition to 25 Mikado type locomotives, has issued inquiries for 6400 cars, including 4000 gondola, 2000 automobile, 200 stock and 200 express refrigerator cars.

The Santa Fe is expected to enter the market for 5000 cars.

The Texas & Pacific is considering the purchase of 2000 cars.

The Chicago, Milwaukee & St. Paul contemplates buying several thousand cars.

The Rock Island has placed 250 refrigerator bodies with the Western Steel Car & Foundry Co.

The General Service Tank Cars, Inc., has ordered 200 tank cars from the General American Tank Car Corporation.

The Chicago Rapid Transit Co. is inquiring for 100 passenger motor cars for elevated trains.

The Northern Pacific is in the market for 15 underframes for express refrigerator cars.

The Mill Power Supply Co., Piedmont, S. C., has bought 10 flat cars from the Kilby Car & Foundry Co.

The Western Fruit Express Co. has placed 100 underframes with the Bethlehem Steel Co. and is reported to have awarded 500 to the American Car & Foundry Co.

The American Refrigerator Transit Co., a subsidiary of the Missouri Pacific, has placed repair work on 700 refrigerator cars with the Sheffield Iron & Equipment Co., Kansas City, Mo.

Doubts are expressed that the 50 low-side cars for the Union of South Africa will be placed in the United States.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....1.90c. to 2c.

Structural Materials

Beams, channels, etc., base, per lb.....2c. to 2.15c.
Sheet piling .....2.10c. to 2.25c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.10c. to 2.15c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.10c. to 2.15c.
Refined iron bars, base, per lb.....2.90c. to 3c.
Double refined iron bars, base, per lb.....4.50c.
Stay bolt iron bars, base, per lb.....6.50c. to 7.00c.

Hot-Rolled Flats

Hoops, base, per lb.....2.60c.
Bands, base, per lb.....2.50c. to 2.60c.
Strips, base, per lb.....2.25c. to 2.50c.

Cold-Finished Steel

Bars and shafting, drawn or rolled, base, per lb.....2.80c.
Bars and shafting, drawn or rolled, l.c.l., per lb.....3.05c.
Shafting, turned and polished, base, per lb.....2.80c.
Bars, S. A. E. Series, No. 2100.....4.25c. to 4.50c.
Bars, S. A. E. Series, No. 2300.....6.00c.
Bars, S. A. E. Series, No. 3100.....4.90c. to 5.00c.
Strips, base, per lb.....4.00c. to 4.25c.

Wire Products

(To jobbers in car lots)

Nails, base, per keg.....$2.80
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.55
Annealed fence wire, base, per 100 lb..... 2.70
Spring wire, base, per 100 lb..... 3.50
Galvanized wire No. 9, base, per 100 lb..... 3.15
Galvanized barbed, base, per 100 lb..... 3.50
Galvanized staples, base, per keg..... 3.50
Painted barbed wire, base, per 100 lb..... 3.25
Polished staples, base, per keg..... 3.25
Cement coated nails, base, per count keg..... 2.20
Woven fence (to jobbers) 726-12½-12, per 100 rods....18.70
Woven fence (to retailers) 726-12½-12, per 100 rods....20.03
Bale ties, carloads to jobbers..75, 5, 5 and 2½ per cent off list

Bolts and Nuts

Machine bolts, small rolled threads,
60, 20 and 10 per cent off list
Machine bolts, all sizes, cut threads..65 and 20 per cent off list
Smaller and shorter, rolled threads..60 and 20 per cent off list
Carriage bolts, cutthreads, all sizes..60 and 10 per cent off list
Hot pressed nuts, blank or tapped, square.....4.75c. off list
Hot pressed nuts, blank or tapped, hexagons....5.25c. off list
C.p.c. and t. square or hex nuts, blank or tapped.4.75c. off list
Eagle carriage bolts.....65, 10 and 10 per cent off list

Semi-finished hex nuts:
⅞ in. and smaller, U. S. S.....80, 10 and 5 per cent off list
⅞ in. and larger, U. S. S.....75, 10 and 5 per cent off list
Small sizes, S. A. E.....80, 10, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 20 per cent off list
Bolt ends with cold pressed nuts.....60 per cent off list
Turnbuckles, with ends, ½ in. and smaller,
55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller,
70 and 10 per cent off list
Washers .....5.75c. to 6.00c.
Lock washers .....80 per cent off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.25	$4.25	⅞-in.	$13.25	$13.50
5/16-in.	4.90	4.90	15/16-in.	16.25	16.50
⅜-in.	5.90	6.25	1-in.	22.50	23.00
7/16-in.	7.50	8.50	1⅛-in.	34.00	34.00
½-in.	9.75	10.00	1-in.	53.00	55.00

Larger sizes—Prices on application.

Cap and Set Screws

Milled hex. head cap screws.....75, 10 and 5 per cent off list
Milled standard set screws, case hardened,
75, 10 and 5 per cent off list
Milled headless set screws, cut thread,
75, 10 and 5 per cent off list
Upset hex. head cap screws, U. S. S. thread,
80, 10 and 10 per cent off list
Upset hex. head cap screws, S. A. E. thread,
80, 10 and 10 per cent off list
Milled studs .....65 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.60
Small rivets.....70, 10 and 5 per cent off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....	$2.80
Spikes, ½ in. and smaller, base, per 100 lb.....	3.25
Spikes, boat and barge, base, per 100 lb.....	3.25
Track bolts, all sizes, base, per 100 lb.....	3.75
Track bolts, heat-treated, base, per 100 lb.....	4.25
Tie plates, per 100 lb.....	2.50
Angle bars, base, per 100 lb.....	2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10....	54	41½	7 to 12.....	26	11
11 and 12...	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+	1	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½.....	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12....	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		Charcoal Iron	
2 to 2¼ in.....	27	1½ in. .....+	18
2½ to 2¾ in.....	37	1¾ to 1⅞ in.....+	8
3 in.	40	2 to 2¼ in.....—	2
3¼ to 3¾ in.....	42½	2½ to 3 in.....—	7
4 to 13 in.....	46	3¼ to 4½ in.....—	9

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	55	3 and 3¼ in.....	36
1¼ and 1½ in.....	47	3½ and 3¾ in.....	37
1¾ in.	31	4 in.	41
2 and 2¼ in.....	22	4½ in. and 5 in.....	33
2½ and 2¾ in.....	32		

Hot Rolled

3 and 3¼ in.....	38	4 in.	43
3½ in. and 3¾ in.....	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30 base.....87 per cent off list
Carbon 0.30 to 0.40, base.....85 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage....	15	2¼-in. O.D. 10 gage..	20
2-in. O.D. 11 gage....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage....	17	1½-in. O.D. 9 gage...	15
2¼-in. O.D. 12 gage..	17	5⅝-in. O.D. 9 gage...	55
2¼-in. O.D. 11 gage..	18	5½-in. O.D. 9 gage...	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb coating, 100 lb. base $11.00		20-lb. coating I. C.....$14.90	
8-lb. coating I. C.....	11.30	25-lb. coating I. C.....	16.20
12-lb. coating I. C.....	12.70	30-lb coating I. C.....	17.35
15-lb. coating I. C.....	13.95	35-lb. coating I. C.....	18.35
		40-lb. coating I. C.....	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.65c. to 2.70c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.50c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....4.75c.

Galvanized

No. 28 (base), per lb.....4.60c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....4.95c. to 5c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.50c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.65
Old range non-Bessemer, 51½ per cent iron	4.90
Mesabi Bessemer, 55 per cent iron	5.40
Mesabi non-Bessemer, 51½ per cent iron	4.75

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.00c. to 9.50c.
Iron ore, Swedish, average 66 per cent iron.	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	45c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.75 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	19.00 to 22.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$95.00
Ferromanganese, British, 80 per cent f.o.b. Atlantic port, duty paid	95.00
Ferrosilicon, 50 per cent, delivered	$72.00 to 75.00
Ferrosilicon, 75 per cent	140.00
Ferrotungsten, per lb. contained metal	90c. to 93c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	10.75c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	10.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent	$32.00 to $33.00
Spiegeleisen, domestic, 16 to 19 per cent	31.00 to 32.00

Ferrosilicon, Bessemer, 10 per cent, $39.50; 11 per cent, $42; 12 per cent, $44.50; 14 to 16 per cent (electric furnace), $36.00.

Silvery iron, 5 per cent, $27.00; 6 per cent, $28.00; 7 per cent, $29.00; 8 per cent, $30.50; 9 per cent, $32.50; 10 per cent, $34.50; 11 per cent, $37.00; 12 per cent, $39.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines		$18.00 to $19.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines		19.00 to 20.00
Per 1000 f.o.b. works:		
Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$40.00 to $43.00	$36.00 to $40.00
Maryland	45.00 to 47.00	40.00 to 42.00
Ohio	40.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00
Silica Brick:		
Pennsylvania		35.00 to 38.00
Chicago		47.00
Birmingham		50.00
Ground silica clay, per net ton		7.50 to 8.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		45.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$38.00
Rolling billets, 2-in. and under	38.00
Forging billets, ordinary carbons	43.00
Sheet bars, Bessemer	38.00
Sheet bars, open-hearth	38.00
Slabs	38.00
Wire rods, common soft, base, No. 5 to ⅜-in.	46.00
Wire rods, common soft, coarser than ⅜-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon, 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2c. to 2.10c.
Skelp, sheared, per lb.	2c. to 2.10c.
Skelp, universal, per lb.	2c. to 2.10c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, lb.	1.85c. to 1.90c.
Rails, light, rail steel, base, per lb.	1.65c. to 1.75c.
Bars, common iron, base, per lb., Chicago mill	2.15c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rail steel reinforcing, base, per lb.	2.10c. to 2.15c.
Rail steel bars, base, per lb., Chicago mill	2c.
Cold-finished steel bars, base, Chicago, per lb	2.80c.
Ground shafting, base, per lb.	3.20c.
Cut nails, base, per keg	$2.90

Alloy Steel

S. A. E. Series Numbers	Bars 100 lb.
2100*(1¼% Nickel, 10 to 20 per cent Carbon)	$3.00 to $3.25
2300 (3½% Nickel)	4.75
2500 (5% Nickel)	6.00 to 6.50
3100 (Nickel Chromium)	3.65 to 3.75
3200 (Nickel Chromium)	5.50 to 5.75
3300 (Nickel Chromium)	7.25 to 8.00
3400 (Nickel Chromium)	6.50 to 7.00
5100 (Chromium Steel)	3.50 to 3.75
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.50
6100 (Chromium Vanadium spring steel)	4.25 to 4.50
9250 (Silicon Manganese spring steel)	3.50 to 3.75
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium)	4c.
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	4.25 to 4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.25 to 4.50
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	3.75 to 4.25
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality, per 100-lb., f.o.b. Pittsburgh. For billets 4 x 4 to 10 x 10-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is $5 a gross ton above the 4 x 4 billet price.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43
Philadelphia, export	0.235	**Cleveland	0.215	Kansas City	0.735
Baltimore, domestic	0.31	**Cleveland, Youngstown Comb.	0.19	Kansas City (pipe)	0.705
Baltimore, export	0.225	Detroit	0.29	St. Paul	0.60
New York, domestic	0.34	Cincinnati	0.29	Omaha	0.735
New York, export	0.255	Indianapolis	0.31	Omaha	0.705
Boston, domestic	0.365	Chicago	0.34	*Denver	1.15
Boston, export	0.255			†Denver (pipe)	1.17

*Pacific Coast	$1.15
*Pac. Coast, ship plates	1.20
Birmingham	0.58
Memphis	0.56
Jacksonville, all rail	0.70
Jacksonville, rail and water	0.415
New Orleans	0.67

*Applies minimum carload 80,000 lb. **There will be no official change until Sept. 1, but, as for some time, the 19c. rate prevails. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingots and muck bars, structural steel, common wire products, including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin (Spot)	Lead		Zinc	
Aug.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
13.....	13.75	13.37½	51.55	8.00	7.70	6.55	6.20
14.....	13.75	13.50	52.62½	8.10	7.80	6.57½	6.22½
15.....	13.87½	13.50	52.87½	8.20	8.00	6.57½	6.22½
16.....	13.75	13.50	52.87½	8.20	8.00	6.57½	6.22½
18.....	13.75	13.50	52.55	8.20	8.00	6.55	6.20
19.....	13.75	13.50	52.37½	8.20	8.00	6.57½	6.22½

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Aug. 19.

Demand for all the metals is active and the prices are higher. The buying of copper has slackened somewhat, but the price tendency is upward. The tin market has been moderately active at higher quotations. The lead market has been distinctly strong, with price levels sharply up. Demand for zinc has been better, with a slight advance in quotations.

Copper.—While both domestic and foreign buying of copper is not quite so large as it was a few days ago, the volume is fairly good and the price situation is exceedingly firm. The buying has been quite heavy for domestic consumption and exporters also have been active. Demand from domestic sources has been the stronger factor. The minimum of the market is 13.75c., delivered. The metal can be bought at this level for delivery throughout the rest of the year. Lake Copper is quoted at 13.75c. to 13.87½c., delivered.

Tin.—Heavy buying of Straits tin prevailed up to Thursday, Aug. 7, with dealers the principal buyers, one in particular predominating. The opinion is prevalent that this buying was due largely to manipulation in order to strengthen the market for unloading the metal now or later. Consumers have been showing more interest, but have done no heavy buying. Sales for the week ended with Thursday, Aug. 7, are reported to have been 1300 to 1500 tons. Friday, Aug. 8, the market was dull, with sales totaling about 100 tons. A little business was done on Saturday, but yesterday the market was quiet. The buying, evidently for supporting the market, stopped on Thursday, Aug. 7, and did not continue. Today the market has also been only moderately active, with spot Straits tin quoted at 52.37½c., New York. In London, quotations today were £255 15s for spot standard, £256 15s for future standard and £256 5s for spot Straits, with the market quiet and steady. The Singapore's quotation yesterday was £259 5s. The London market today was about £5 per ton higher than a week ago. Arrivals thus far this month have been 2380 tons, with 4480 tons reported afloat.

Lead.—Buying has been very heavy and the market is exceedingly strong. Conditions have almost approached a runaway market. On Aug. 15 the leading interest advanced its quotation from 7.75c. to 8c., New York, the outside market having already passed that level. Various quotations are heard for the metal at New York, some running as high as 8.37½c., but the higher prices, if realized, evidently refer to exceptional conditions. A fair appraisal of the outside market is 8c., St. Louis, or 8.20c., New York.

Zinc.—A distinctly stronger tone with somewhat higher prices pervades the prime Western zinc market. This condition is due largely to better buying by consumers and by operators. The metal for early delivery is quoted at 6.22½c., St. Louis, or 6.57½c., New York. Sales for exports are not as heavy as in the past few weeks.

Nickel.—Quotations for shot and ingot nickel are unchanged at 27c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers.

Antimony.—The market is considerably stronger. Buyers are bidding 9.50c. and sellers are asking as high as 10c., New York, duty paid. It is doubtful whether the metal can be bought at less than 9.75c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 26.50c. to 27c. per lb., duty paid, delivered. A large motor manufacturer is inquiring for 100 tons.

Old Metals.—Business is good and prices tend upward. Dealers' selling prices are as follows:

Copper, heavy and crucible	13.25
Copper, heavy and wire	12.00
Copper, light and bottoms	11.25
Heavy machine composition	10.50
Brass, heavy	8.50
Brass, light	7.00
No. 1 red brass or composition turnings	9.25
No. 1 yellow rod brass turnings	7.75
Lead, heavy	7.25
Lead, tea	6.00
Zinc	4.25
Cast aluminum	17.00
Sheet aluminum	17.00

Chicago

AUG. 19.—Business has shown further improvement with advances in all of the metals except zinc. Lead is very strong and considerable copper has changed hands during the week. Demand for antimony is the best in weeks. Zinc alone has failed to participate in the movement affecting the other metals and it is common opinion that it will remain quiet unless export demand revives. Among the old metals a number of copper, brass and lead grades have advanced. We quote in carload lots: Lake copper, 14c.; tin, 53.50c.; lead, 8.10c.; spelter, 6.25c.; antimony, 11c., in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 11c.; copper bottoms, 9.25c.; red brass, 8.50c.; yellow brass, 7.25c.; lead pipe, 7c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 33c.; block tin, 36c.; all buying prices for less than carload lots.

Valuable Charts Issued by the Lake Superior Iron Ore Association

CLEVELAND, Aug. 18.—Several charts showing the distribution of Lake Superior Iron Ore and also Eastern and foreign ores during 1923 have been issued by the Lake Superior Iron Ore Association. A year ago this association started to show the distribution of ore graphically on a map, but the charts give more complete data.

One chart shows the production of Lake Superior ore by ranges and its distribution through upper lake ports and receipts at lower lake and other ports, the figures showing the tonnage in units of 100,000. On the same chart the all-rail shipments are similarly listed. Another chart shows the distribution from Lake Erie ports to the various consuming points and districts. This indicates that approximately 500,000 tons of Lake ore went to Philadelphia, 500,000 to Bethlehem, Pa., and 450,000 tons to Harrisburg, Pa. The largest amount received at any other Eastern consuming point was 90,000 tons.

Importation and distribution of foreign ores are listed in another chart. The receipts from the principal shipping countries were 750,000 tons from Sweden, 650,000 tons from Chile, 350,000 tons from Africa and 200,000 tons from Spain. Small lots came from Greece, Newfoundland and Germany. Of the 2,730,000 tons of foreign ore received 1,300,000 tons went to Sparrows Point. Of the remainder, 450,000 tons was received at New York and 900,000 tons at Philadelphia for distribution to eastern Pennsylvania furnaces. Norfolk, Va., received 50,000 tons and Charleston, S. C., 10,000 tons. The consuming points of ore from Eastern mines are also shown.

Discussion of the nation's fuel supply will be a prominent feature of the fall meeting of the American Chemical Society to be held at Cornell University, Sept. 8 to 13. Prof. S. W. Parr of the University of Illinois will lead round-table conferences on "The Storage of Coal and Spontaneous Combustion."

PERSONAL

Max Buhle, professor at the Dresden Technical University, Dresden, Germany, who paid a visit to this country in the year 1898, arrived in New York Aug. 15 to study the development of American railroads, locomotives and cars, maintenance of way and engineering improvements, and also in connection with the foregoing, terminal and other transportation problems. He is also interested in material handling machinery, and is making a study of the evolution of transportation terminals and kindred subjects in the 26 years since he was last here. Professor Buhle says it was not so long ago that the United States was considered a laboratory where new transportation methods were tried out, but in the meantime, while the laboratory has remained, the scientific results have been such that the United States now ranks foremost in the field. He is desirous of receiving descriptive pamphlets and literature for use in the compilation of a new book pertaining to the problems mentioned, probably a revision of his "Massentransport," which contains numerous reproductions of photographs and drawings of American installations. He may be addressed care of Thomas Prosser & Son, 15 Gold Street, New York.

Allan A. Johnson has been appointed vice-president of the Eagan-Rogers Steel & Iron Co., with offices at Crum Lynne, Pa., and Gilbert H. Johnson, Jr., has been appointed New York representative.

John T. Wood, president William Jessop & Sons, Inc., New York, sailed Saturday, Aug. 16, on a business trip to Europe.

Stanley J. Wallace, for the past 18 months assistant superintendent of the Conneautville, Pa., plant of the Burke Electric Co., Erie, has been appointed general superintendent of the former plant, succeeding the late Byron L. Ferguson.

Joseph D. Childers has become affiliated with Clayton Mark & Co., Chicago, in a sales capacity. Mr. Childers was with the South Works of the Illinois Steel Co., Chicago, from 1909 to 1918 and later with the Mark Mfg. Co., the Steel & Tube Co. of America, and Youngstown Sheet & Tube Co. as Iroquois Works auditor.

Thomas J. Bray, president Republic Iron & Steel Co., Youngstown, Ohio, is reported greatly improved at the Mercy Hospital, Pittsburgh. He was taken seriously ill while in that city Aug. 10.

J. J. Wilson has severed his active connection with the foundry of Hiram Walker Metal Products, Ltd., Walkerville, Ontario, but is retained in an advisory capacity. He is known throughout the industry through his long connection with the Cadillac Motor Car Co., Detroit, and the American Foundrymen's Association. He is spending the summer in travel.

Earle O. Hultquist, for the past six years secretary and treasurer Art Metal Construction Co., Jamestown, N. Y., manufacturer of metal office furniture, bank vaults and other metal equipment, has resigned. He will become active in the management of the Jamestown Upholstery Co.

Charles P. Perin, consulting engineer, New York, returned Aug. 16, from a brief stay in France in connection with the electrolytic production of iron into iron tubes, seamless cylinders, and in forms for rolling.

Jacob H. Mohr, superintendent of the Carrie Furnaces, Carnegie Steel Co., Rankin, Pa., whose recent death was noted in these columns, succeeded in that position George K. Hamfeldt, who now is president of Oxelosunds Jarnwerksaktiebolag, Oxelosund, Sweden. Mr. Hamfeldt resigned from the Carnegie Steel Co. in 1905 to become general manager of the Midland Steel Co., Midland, Pa., plant of which formed the nucleus of the present Pittsburgh Crucible Steel Co. Returning to Europe in 1908, he was for several years with de Wendel & Co., in France, founding his own company after the war. His company has a 300-ton blast furnace and a by-product coke plant, and late advices are that the plant is doing well.

OBITUARY

LUTHER A. ROBY, for nearly 25 years associated with the Otis Steel Co., Cleveland, and for a long time superintendent of that company's steel foundry and later superintendent of the foundry of the Wellman-Seaver-Morgan Co., Cleveland, for 20 years, died at his home in Cleveland, Aug. 14, aged 71 years. He retired from the latter company five years ago.

EDWIN THOMAS, aged 70, identified for years with the iron and coal industries in the Lehigh Valley, died at his home in Catasauqua, Pa., Aug. 17. He was president of the Pioneer Mining & Mfg. Co., Alabama, before that company was taken over by the Republic Iron & Steel Co. in 1899.

WALTER HUBERT MOORE, secretary-auditor Gulf States Steel Co., Birmingham, Ala., died Aug. 17 of uremic poisoning. He was ill one week.

JOSIAH E. BACON died suddenly Sunday, Aug. 17, at York Cliff, Me., at the age of 80. He was a member of the firm of Bacon & Co., Boston, and dean of the Boston iron and steel trade. At a meeting of representatives of the iron and hardware trade held Monday at the rooms of the New England Iron and Hardware Association, Boston, E. P. Sanderson, E. P. Sanderson & Co., Cambridge, Mass.; R. F. Boutwell, Standard Horseshoe Co., Boston, and A. B. Marble, Jones & Laughlin Steel Corporation, Boston, were appointed a committee on resolutions on the death of Mr. Bacon. Mr. Bacon made his home in West Newton, Mass.

HENRY J. WANNER, chairman of the board, Wanner Malleable Castings Co., Hammond, Ind., and Beloit, Wis., died of pneumonia at his home in Chicago, Aug. 18, aged 65. Mr. Wanner was the founder of the Hammond Malleable Iron Co., the name of which was changed to the Wanner Malleable Iron Co. a decade ago. With the acquisition of the Beloit plant in May, 1923, the corporate style was again changed to the Wanner Malleable Castings Co.

The plant and equipment of the Sharon Pressed Steel Co., Sharon, Pa., is being liquidated by the Midland Bank, Cleveland, which recently bought it as trustee for the bondholders. The Sharon company went into receivership about a year ago as a result of being involved in financing conducted by the Cleveland Discount Co., which went into receiver's hands at that time. The bank has attempted to find a buyer for the property as a complete plant, but being unable to do so, has sold a portion of the equipment and turned the remainder over to a Cleveland machinery dealer for disposal. The buildings have not yet been sold.

The Electric Power Club, an association of manufacturers of electric power apparatus and control equipment organized for the standardization, improved production and increased distribution of such products, will hold its fall meeting at the Greenbriar, White Sulphur Springs, W. Va., Oct. 20 to 23, inclusive. The headquarters of the club are in the B. F. Keith Building, Cleveland.

Six of the 27 plants of the American Sheet & Tin Plate Co. operated during the month of June without a single lost time accident.

BOOK REVIEWS

The Manufacture of Electric Steel. By Frank T. Sisco. Pages, x + 304, 6 x 9¼ in. Figures and illustrations, 44. McGraw-Hill Book Co., Inc. Price, $3.

Following close upon Dr. Stansfield's book on "The Electric Furnace for Iron and Steel," the same publishers have issued Mr. Sisco's "Manufacture of Electric Steel."

It consists of 13 chapters, the first five of which are largely introductory in character, the next five containing the real value of the book, and three concluding chapters. Chapter 1 is a discussion of the past, present and future of electric steel. In many respects it is exaggerated and very controversial. Next comes a chapter on materials which is rather sketchy and in some places inaccurate but includes very good tables of analyses. Chapter 3 is on electric arc furnaces in general. The Heroult is considered as the standard. There are excellent sections on the power supply for the arc furnace and on electrodes. This chapter is followed by one of 15 pages on the Heroult furnace in detail where the 6-ton furnace is chiefly dealt with, and in the next chapter the other direct arc furnaces are taken up.

The next five chapters deal with the furnace practice in the making of electric steel and are of great value. They are evidently written by one who is acquainted with his subject. The language is clear and expressive and they can be read with great profit by steel makers using any process, crucible, Bessemer or open-hearth as well as electric. In these chapters the Heroult furnace is again taken as the standard. The first of them is Chapter 6 on the cold scrap process. Great stress is naturally laid on deoxidizing and the methods by which this is brought about, and the chapter closes with that axiom of good steel makers that the steel must be made in the furnace, not in the ladle. This is followed by a splendid chapter on the chemistry of the basic electric process, which includes good analyses of the carbide slag It lays proper emphasis on the great importance of the slag in steel making and also of non-metallic impurities on the properties of the finished steel. Chapter 8 is on variations in melting practice with the cold scrap process, that is, melting with thorough oxidation, with partial oxidation and without oxidation. In this chapter are very complete records of two heats, one a plain carbon chisel steel and the other a nickel-chrome heat. It is probably the best part of the book and as mentioned before is of value to steel makers using any process. Next comes a chapter on the making of special steels with good sections on high-speed steels, nickel, nickel-chrome and carbon tool steels; followed by chapter 10 on hot metal processes.

The remainder of the book takes up electric steel pouring practice, the characteristics of basic electric steel and acid melting practice. The first of these chapters on pouring practice is again controversial in character and by no means so good as the parts on steel making, while the other chapters are both good discussions of their subjects. A rather striking feature of the book as a whole is the lack of references, although the literature of electric furnace practice is already quite extensive. G. B. WATERHOUSE.

Under the title "Refractory Facts" the Walsh Fire Clay Products Co., St. Louis, has issued a 150-page book in the nature of a treatise dealing with fire brick and fire clay. While naturally the local color of the company attaches to many of the descriptive parts, the work is of general utility as a reference book on this subject. Tables are given showing various types of brick, while the illustrations are numerous and indicate the uses of some of the special types. The elementary principles of the technology of fire clays are dealt with in some detail in the book, including a brief discussion of the chemical properties involved. A description of the method of manufacture is given, while the tables usually accompanying a handbook of this sort occupy a number of pages. A copy of the book may be obtained on application to the company which issued it.

Under the title "Thermolith, the All-Temperature Fire Cement," the Harbison-Walker Refractories Co., Pittsburgh, has issued a well illustrated booklet of 36 pages devoted to the uses of this product in the various industries in which it is employed and including scientific data relative to its performance. Blast furnaces, boiler settings, brass, open-hearth and heating furnaces, soaking pits, pottery, brick, lime and cement kilns, gas generators, forging and welding furnaces and glass plants, all find use for the material. Tests are reported in comparison with Seger cones at temperatures running up to about 3200 deg. Fahr. The book is arranged as a handbook, to enable users and prospective users to ascertain how the material may best be devoted to their specific practices.

The proceedings of the World Power Conference recently held in England will appear in four volumes containing approximately 5500 pages. They will be published by Percy Lund, Humphries & Co., Ltd., 3 Amen Corner, London E. C. 4. England. A price of £10 has been set on the four volumes if ordered before Sept. 1 and £12 if ordered after Sept. 1. The papers contributed are grouped under five main headings: power resources, power production, power distribution, power utilization and general. The character and scope of the papers, drawn from all the industrial nations, indicate that the volumes will bring the technology of the subject up to date. Considerable space is given to the preparation of fuels and economical use in different industries and the volumes promise to be of a monumental character unique in the annals of technical literature.

As a commentary on the renewal of efforts which the leading German engineering concerns are making to intrench themselves in world business, may be mentioned the appearance of a 446 page volume profusely illustrated and artistically printed on high quality paper in the English language, issued by the Deutsche Maschinenfabrik of Duisburg, the well known Demag. Practically every page contains the reproduction of a photograph of a conspicuous production of Demag, accompanied by descriptive information. The book is divided into three parts and covers a large variety of cranes, crane bridges and other high capacity material handling apparatus built for harbors and water ways, for handling material of industrial plants, ship yards and the like and for general loading and unloading of ships and the upkeep of yards.

New Books Received

Die Legierungen. By A. Ledebur. Sixth edition. Pages, 424, 7 x 10½ in.; illustrations, 154. Published by M. Krayn, Genthiner Strasse 39, Berlin W. 10, Germany. Price, 20 gold marks.

National Foreign Trade Convention. Official report of the eleventh convention, India House, Hanover Square, New York. Pages, 625. Price, $2.50.

Metallurgical Analysis. Fifth edition. By Nathaniel W. Lord and Dana J. Demorest. Pages, 472; tables, charts and diagrams. Published by McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York. Price, $4.

Vertical Turret Lathe in Railroad Work

Illustrations of vertical turret lathes in operation on a variety of work in several railroad shops are included in a 63-page reference booklet under the title of "Vertical Turret Lathe Practice in Railroad Shops," recently published by the Bullard Machine Tool Co., Bridgeport. In connection with most of the installations shown, the tool equipment and operation layout are indicated in diagram.

Specifications and illustrations of the company's 24, 36, 42 and 54-in. New Era type vertical turret lathes are included, the same being given for the 44, 54 and 61-in. Maxi-Mill and the Bullard driving box borer and facer. Data also are given on standard tool equipment. The booklet is attractively arranged and well illustrated, and should be of value to those interested in current railroad shop practice.

(*Continued from page* 432)

directors of the United States Steel Corporation, to proceed at once to eliminate the 12-hr. day in the corporation's mills.

"Judge Gary's order, it will be recalled, followed a rapid succession of events during which public opinion expressed itself as opposed to the continuance of the 12-hr. day in such certain terms that the chairman of the Steel Corporation himself said it was a factor which could no longer be ignored. The report of the committee of the American Iron and Steel Institute made in May, 1923, against proceeding at once to the elimination of the long day was condemned editorially by the press of the country almost without exception. The churches, through the Federal Council of the Churches of Christ in America, protested against it. The American Federation of Labor immediately launched a new organizing campaign with the elimination of the 12-hr. day as its slogan.

"Finally, in June, 1923, President Harding, who in 1922, at the suggestion of the Cabot Fund trustees, had held a dinner conference of executives in the steel industry to discuss the elimination of the 12-hr. day, sent a letter to Judge Gary pressing for immediate abolition of the two-shift system in the steel industry. The directors of the American Iron and Steel Institute replied within a few days that the system would be abolished at the earliest time practicable, and on Aug. 15 Judge Gary issued his orders, which were but the signal for many other companies to follow, notably the Bethlehem Steel Corporation, the Jones & Laughlin Steel Corporation and the Youngstown Sheet & Tube Co.

"In undertaking the present survey in April, 1924, the trustees of the Cabot Fund were fully aware that effects of the change on production, on costs, on the lives of the workers or on the common welfare could not be measured in the brief period of eight months during which the industry as a whole had experimented with the shorter day. Many of the social results may not appear for another generation.

"Nevertheless, the trustees believed public interest in the elimination of the long day was great enough to warrant an effort to learn how far it had been eliminated, why it persisted in certain places and the results so far as they were available.

"The report does not pretend to be exhaustive. It is merely an indication of the changes brought about in the industry and in the communities affected, based on data from representative districts.

The Number of Hours Worked

"The steel industry of the United States has by no means gone over to an 8-hr. day and a 6-day week since the recent movement toward the elimination of the 12-hr. day began.

"Though there are notable but rare instances where the 8-hr. day has been practically made universal, the general tendency where the change has been attempted has been to put the blast furnaces, open-hearth and Bessemer converting departments where work is continuous and where the 12-hr. day formerly prevailed, onto a three-shift system, the men working 8 hr. a day for seven days a week; to put the rolling mills on a two-shift system, the men working 10 hr. a day usually for six days a week, and to reduce men formerly on a 12-hr. day of one shift to 10 hr.

"The seven-day week in continuous processes to an extent eliminated during the depression of 1921 but reestablished with the return of prosperity by the fall of 1922, prevails and has perhaps been more widely established under the new system. Though officials of the corporation say the executive orders of the United States Steel Corporation were 'very specific' on the point that all continuous processes were to be put on three shifts and all 8-hr. men in these departments on a six-day week, such a schedule was not found to prevail. Testimony from both steel executives and workers shows that the 8-hr. men in these processes work a seven-day week, both in the corporation's and in the independents' plants. On Aug. 13, however, after this investigation was completed, the presidents of the United State Steel Corporation's manufacturing subsidiaries in executive meeting stated the seven-day week was now eliminated in all their plants.

"The three shifts are rotated so that the worker changes his hour-schedule each week-end. There are two prevailing schedules. According to one the worker has but 8 hr. off when he changes his turn at the end of the first week, 32 hr. off at the end of the second, and 8 hr. off at the end of the third. In other words, he works 16 hr. out of 24 two out of every three times the shift changes, but with 8 hr. for rest between the two 8-hr. shifts. In return for this he gets 32 consecutive hours' rest every third week-end.

"According to the other schedule he works 16 hr. consecutively out of 24 hr. two out of every three times the shift changes, and thus wins 32 hr. consecutive rest two out of every three week-ends.

"Though the change to the shorter day may be said to have come in the steel industry as a whole, there are many companies which have announced their recognition of it but still for various reasons employ hundreds of 12-hr. men. There are also a number of the small independents which have made no change either in hours or in wages.

"Labor leaders state that the Carnegie Steel Co., the Republic Iron & Steel Co. and the Youngstown Sheet & Tube Co. employ large numbers of 12-hr. men in Youngstown, and that the Bethlehem Steel Corporation continues to employ a considerable number of 12-hr. men in its Pennsylvania plants.

"The independents have made no change in eastern Pennsylvania and in the Birmingham district, and are but 70 per cent over in the Pittsburgh district. In all other districts the movement seems to be well under way.

"The most comprehensive figures available showing the extent to which the industry has eliminated the 12-hr. day and instituted the 8-hr. day in the departments most affected by the recent movement are those compiled by the United States Department of Labor for the half-month pay period, Jan. 16 to 31, this year. All steel establishments were not covered in the survey, but enough, the department claims, to be representative of each district and to show local conditions.

"The data presented by the Department of Labor would seem to indicate that on the blast furnaces less than 8 per cent of the men work 48 hr. or less a week; 6 per cent work 84 hr. a week; 32 per cent, 60 hr. or over, and 54 per cent more than 48 or less than 60 hr. Seventy-five per cent of the laborers, who form about one-fifth of the employees in the blast furnaces reported, work over 60 hr.

"In the open-hearth departments 4 per cent of the men work 48 hr. or less; 1½ per cent, 84 hr.; 19 per cent, 60 hr. or over, and 75 per cent more than 48 but less than 60 hr. Of the laborers who make up more than one-fourth of the employees of the departments reporting, 55 per cent work over 60 hr.

"On the Bessemer converters where the 8-hr. day has been in force to some extent since 1907, more than 50 per cent of the men are now on a 48-hr. week, while 80 per cent of the laborers are not at work more than 60 hr. a week.

Increase in Labor Force Required

"Steel executives were unwilling to give specific data as to the additional number of men required with the decrease in number of hours worked, chiefly on the ground that the experiments were too new for any data to be conclusive.

"In the rolling mills where the men have been put on two 10-hr. shifts and on a tonnage pay basis, there has been no increase in the number of men employed for the reason that the workers are turning out the same or more tonnage in 20 hr. than they formerly turned out in 24. Testimony to this effect is almost universal.

"For the same reason few additions have been necessary to the one-shift forces reduced from 12 to 10 hr. Even where these men have not been spurred on by sharing in the tonnage pay basis or by bonuses, they have, according to one official, 'cut out the loafing,' though they have not actually accomplished more work in the reduced hours. An official of one of the steel

corporation's subsidiaries, speaking of this group of men and commenting that he believed the company would soon go to 8 hr. for all workers, said: 'We have some superintendents today who are ready to go on record that the 10-hr. men loaf about 2 hr. and that 8 hr. work would bring about the same results in production.'

"An official of a prominent iron and steel association in the Pittsburgh district estimates the increase in the number of men on the blast furnaces and in the open-hearth departments as 12½ per cent. This slight increase has been accomplished, for the most part, by operating the furnaces not as single units, as formerly, but as departments using the same crew on different furnaces.

"More than one company is operating its blast furnaces three shifts with no increase in the number of men over the two-shift operation. This is notably the case with the American Rolling Mill Co. at its plant in Ashland, Ky. Though the two furnaces were of the old type, the company found when it changed to three shifts in November, 1923, that with two-furnace operation they could make the change without any increase in force. On one-furnace operation, however, it was found necessary to add 11 men. At the same time, production increased notably and accidents were reduced.

"Where a full third shift or 50 per cent increase in the number of men has been made, it appears, in some cases, to be in the most efficiently organized departments of small mills where already jobs had been reduced to a minimum and where the number of men involved was of no consequence. In other instances it seems to have been the result of 'going over with a club,' as an engineer has expressed it, with no effort to organize for greater efficiency.

"The United States Steel Corporation has stated that the change involved an increase of 10 per cent in the number of employees required in the corporation companies affected.

Recruiting the Labor

"Labor was for the most part found in the immediate communities where the change was instituted for the reason that production in the steel mills had dropped at the time and many men had been laid off.

"The new skilled positions were filled by promotions from the ranks, by former steel workers who had left the industry because of the long day but applied for jobs immediately when the short day was announced, and by a high grade of men of the communities who had formerly avoided the mills because of the long hours.

"Unskilled labor was in most places plentiful, because during the first seven months of 1923 when production was high, thousands of negroes and Mexicans had been brought North to substitute for the European immigrant who was no longer the source of supply. As production picked up in the fall of 1923 and more labor was needed, it was again recruited in the Southern States and near the Mexican border. Today the negro and the Mexican are generally accepted as the laborers of the steel mills.

Results as to Wages

"Without exception the men changed from the 12 to the 8-hr. day have been given 10 hr. pay. In other words, the company and the workers have shared the loss. Because of promotions to fill the higher positions in the third shift, however, about one man in every six in the departments concerned has had an increase in earnings. This has made for contentment among the key men.

"The men changed from 12 to 10 hr. have fared differently in different companies and in different districts. In the rolling mills where they have been put on tonnage, they are making the same money or more than before the change.

"Ten-hour men on an hourly basis, who have been reduced from 12 hr., have usually been given 11 hr. pay. In some mills, however, notably in the plants of the Tennessee Coal, Iron & Railroad Co. (United States Steel Corporation), in Birmingham, and in the Jones & Laughlin Steel Corporation, they are receiving straight 10 hr. pay with some exceptions evidently made to keep the good will of key men.

"Statistics of the United States Department of Labor for the period from Jan. 16 to Jan. 31 of this year show a considerable increase in both hourly and full time weekly earnings over last year for the principal productive occupations combined in the blast furnace, open-hearth and Bessemer converting departments.

Effects on Costs

"The announcement of the United States Steel Corporation that the anticipated increase in cost to the corporation of the institution of the three-shift system would be $35,000,000 yearly, is looked upon with skepticism by steel executives in different parts of the country. They believe that the corporation has put the figures on the safe side of the ledger and that a new technique in management as well as a piling up of indirect beneficial results will reduce the figure considerably.

"The actual increase in cost has been placed by many steel men at an average of $3 a ton of finished steel—$4 on sheets and $2 on billets. A general manager of a large steel company in the Middle West says he is convinced from experience in his own mills that the increase should not be so great and that it will be reduced.

A representative of one of the largest of the independents states his belief that the actual labor cost of the three shift system cannot be reduced to that of two shifts but that the indirect results will more than make up the difference. He points to the economy that has been realized in safety work and says that the shorter hours will bring about the same results.

" 'The three-shift system will be an economy in cost of production,' he says. 'Give it time. It will bring about a change in the whole of industrial relations and that is what has cost the steel industry money. Steel executives realize this economy. It was the greatest factor in the change, though public opinion pushed the movement forward.'

Effect on Production

"Testimony is overwhelmingly to the effect that the movement toward shorter hours has had a beneficial effect on production. During March various rolling mills and open-hearth furnaces broke all previous records for production.

"In the rolling mills the men are turning out as much in 10 hr. as they formerly did in 12.

"In the open hearths and on the blast furnaces, where the pay is on a tonnage basis or where a bonus is paid, the output of the three shifts is divided between all men on the three shifts. Thus it is to the advantage of a workman to push a heat forward rather than to hold it back. An operating official of the Bethlehem Steel Corporation points to this situation as a factor in getting better quality of product and more careful work from the men.

"The American Rolling Mill Co. reports for its blast furnaces at Ashland, Ky., that previous to the change to three shifts 256 tons was the average daily output of a furnace. As late as July 31 the company stated that during no month since the change last November has production for the furnace been below 300 tons a day. In March the average was 345 a day with a single day's record of 393 tons.

"Increased tonnage is reported for practically all departments, especially where tonnage is the basis of pay. One mill reports the furnaces showed a marked decrease when the change was first instituted but within a few months production was back to normal.

Social Results

"It is still too soon after the change to the shorter day, complicated as that change is by the influx of new labor due to the stoppage of immigration, to report many of the social results.

"To date, however, the most obvious and perhaps the most significant are:

"1. The more normal appearance of life in the steel towns. Men on the street not in their mill clothes, marketing for their wives, or 'just looking'; on their

porches reading newspapers or playing with their children; working in gardens or about their homes, or in their autos.

"2. Less tension in the towns. The men seem freer in their conversations, show a better spirit toward the mill. This is especially true of the American born.

"3. An increased tendency on the part of the workers to look into affairs concerning their own living conditions.

"On the other hand, the outstanding social fact of the mill towns (a fact due not to the change in hours but rather to the stoppage of immigration, but which nevertheless cannot be separated from any consideration of the social results of the change in shifts) is the influx of new types of laborers (the Mexican and the Southern negro) without any adequate plan to aid in absorbing these newcomers into the community.

"Inadequate housing is the crux of the whole situation There are practically no houses for the new laborers. As a result their families cannot follow them, there is no home life and no community life worth the name. Vice in all its forms—prostitution, gambling, bootlegging—has got hold.

Satisfaction with the Change

"Neither employers nor workers would return to the 12-hr. day. There is overwhelming evidence on this point. One of the highest operating officials of a subsidiary of the United States Steel Corporation, says: 'The steel industry is not going back to two shifts even during war.'

"An official of another company of the same corporation says: 'Even the foreigners, whom we used to think wanted the longer day for the larger pay, have shown no discontentment.'

"There are enough men making more money on the short hours because of the promotion or of tonnage pay, to set the pace for a contented lot. Skilled men whose earnings have been reduced say emphatically that they want the higher pay but are so pleased with the short day that they are in no mood to fight.

"There are some few laborers with reduced earnings who want more hours for more pay. Especially is this true of the man with a family who has been in the community for some time. He sees 12 hr. work as the only relief for the pressure of family needs.

"The new laborer is satisfied with the reduced wages since he has known no other, but he does not like the living conditions. He, especially when he is alone, wants to work two shifts to earn all the money he can. In the Youngstown and Pittsburgh districts, occasional men work two shifts for three days of the week.

"Organized labor realizes that the steel workers are satisfied for the present and while propaganda is aimed at restoring the wage the policy of the American Federation of Labor's Iron and Steel Committee has definitely been changed from the campaign of action started in May, 1923, to the carrying out of an educational program.

Leisure Time

"The men for the most part seem to be enjoying their increased leisure time rather than making any conscious constructive use of it Considerable time is spent about the house, on repairs, enjoying the children, aiding the wife. There is a great tendency to buy automobiles and to make more family use of those already owned. Men are reported taking homes in the suburbs, using trains or auto service to the mills. The shorter hours are also drawing labor from surrounding districts for 15 miles or more, so that many mills report serious difficulty in finding sufficient parking space for the workers' cars.

"Leisure time is also used to increase the family income. Two shifts at the mill has already been referred to. In Gary and at other places, steel workers are reported writing insurance and acting as salesmen, especially in automobile and electrical lines. Mechanics in some places work 'at the garage' after hours and laborers pick up extra jobs."

Conclusion

The report concludes by pointing to the present period of unemployment as a great opportunity for the industry to make complete its elimination of the long day. It refers to the continued and perhaps increased prevalence of the seven-day week, to the thousands of men still working 84 hr. a week before the furnaces even though the number has been encouragingly reduced, and to the fact that a very large percentage of men in the basic processes in steel are working more than 10 hr. a day for six days of the week.

"Public opinion in the United States," says the report, "has registered its disapproval of these practices. With their elimination deferred by the employers, there remain but two means of relief—legislation or the renewal of an intense labor struggle."

Crane Maker Acquires Steel Foundry

The Pawling & Harnischfeger Co. of Milwaukee, now celebrating its fortieth year of progress in the manufacture and sale of crane and excavating machinery, has acquired a steel foundry, which was formerly operated by the Hercules Steel Casting Co., for commercial production. It is now entirely devoted to the steel castings required for the production of P. & H. machines. When operating two shifts it is capable of turning out all of the 400 tons of carbon steel and alloy steel castings required by the company per month.

The foundry is served by a 10-ton electric, acid lined furnace. Two 10-ton overhead electric traveling P. & H. cranes handle the ladles and heavy castings, etc. Cleaning, rattling, sand blasting, welding and annealing departments prepare the castings, which are inspected and weighed before being sent out. Baking ovens for dry sand molds, sand screens and grinders, with a special belt conveying system for handling sand, is also used in conjunction with the molding floor. The core making department is equipped with two oil fired furnaces and a small gas fired furnace. A 3-ton P. & H. electric hoist handles the heavy cores and oven pans.

The storage yard is equipped with a P. & H. model 206 corduroy crane for handling heavy materials and has a magnet attachment for handling the pig, scrap, punchings, etc., from the separate bins to the furnace.

A pattern and carpenter shop, pattern storage shed, chemical and physical laboratory are run in conjunction with the foundry. In the production of overhead traveling cranes, hoists, gasoline powered shovels, draglines, skimmer scoops, trenchers and other equipment, the Pawling & Harnischfeger Co. now has full control of the process from "pig iron to finished machine."

Data on Pipe for Power Plants

Fundamental considerations helpful in connection with piping for power plant service are presented in Bulletin No. 10 of 51 pages, recently issued by the National Tube Co., Pittsburgh. Basic factors of design and installation of piping systems are set forth, and the uniformity, physical properties, ductility, welding and threading qualities, and other advantageous characteristics of the company's pipe for power plant service are described and illustrated. Considerable information is given on the use of welding in power plant piping and a technical section of 23 pages includes standard specifications for power piping, weights, dimensions, etc., of various classes of pipe and fittings, information on bends, pipe columns and hand railings, articles on steam and various other data helpful in power plant design and operation.

An open competitive examination for assistant structural engineer in the office of the supervising architect, Treasury Department, Washington, will be held Sept. 17. Application blanks may be obtained from the United States Civil Service Commission, Washington.

The City of Seattle, Wash., has awarded the contract for a Madison Street railroad cable, 14,150 ft. long and 1¼ in. in diameter to the Wire Rope Mfg. & Equipment Co., Seattle.

Plans of New Companies

The American Ship Breaking Corporation, New York, has been incorporated with $75,000 capital stock to operate a general shipyard and repair works. Activities have been started with the purchase of five ships which will be operated as wreckers. Address in care of F. A. Morny, H. L. Crawford & Co., 50 Broad Street, New York.

The Meter Control Corporation, care of Sol Woronoff, 1133 Broadway, New York, has been incorporated with $300,000 capital stock to manufacture a new taxicab meter. No plans have been made for manufacturing, but this matter will be taken up soon. All work is to be done by contract. G. C. Nordinger, A. Kimmell and C. B. Schweitzer are the incorporators.

The Colonna Safety Appliances Corporation, 278 Court Street, Brooklyn, incorporated with $100,000 capital stock, will manufacture heating appliances and equipment. Operations are now under way. F. Colonna and M. V. Montalbano are the incorporators.

Household Appliances Corporation, 1 Elton Street, Rochester, N. Y., has been incorporated with $100,000 capital stock and 1500 shares of stock, no par value, to take over the business and properties of a manufacturer previously engaged in making washing machines and parts. The new corporation will continue along the same lines. Lawrence A. Anderson, 27 Cedar Street, New York, is corporate representative.

The De Luxe Clock & Mfg. Co., 1107 Broadway, New York, incorporated with $150,000 capital stock, will continue a business as distributor of clocks and clock movements. All manufacturing is done in Waterbury, Conn. L. Stern, R. V. Kohn and H. Wessler are the incorporators.

The Ballard Oil Equipment Co. of Pennsylvania, Inc., has been organized as a subsidiary of the Ballard Oil Equipment Co., manufacturer of various types of oil equipment. Headquarters of the parent company are at 120 Broadway, New York. Capital stock of the newly organized unit is $500,000. A. H. Ballard is president; Reginald C. Heath, vice-president and David H. McAlpin Pyle, secretary-treasurer.

The Dow Transmission Corporation, New York, has been organized to develop an automobile transmission in which the control of shifting of gears is exercised from the engine throttle. Alexander Dow, a pioneer in type-setting machinery, and also known as a consultant and manufacturing expert, is the inventor of the system, which has been developed and now is entirely controlled by the American Car & Foundry Co., 165 Broadway, New York. The Car & Foundry company is already engaged in manufacturing automobile accessories in addition to railroad equipment. It operates 23 plants and among its products are wire wheels, carburetors, valves, etc.

Ruwe Brothers, Inc., 765-69 Atlantic Avenue, Brooklyn, has been organized to act as dealer in heavy hardware, blacksmiths' supplies, contractors' supplies, etc. It is successor to the firm by that name, which was organized in 1891. W. G. Edinburg is president.

The Twin-High Transmission Co., Inc., Syracuse, N. Y., has been incorporated with capital stock of $1,000,000, Delaware laws, to manufacture electric power transmission line equipment. Manufacturing plans will be announced in a later issue. A. Heminger is secretary-treasurer.

The Flint Malleable Castings Co., Flint, Mich., has been incorporated with $500,000 capital stock and plans to build a factory, 300 x 1150 ft. It is estimated that initial output will be about 7000 tons per year. John M. Barringer is president and Fred J. Weiss, vice-president.

The C. A. Zahrndt Mfg. Co., 6209 Hamilton Avenue, Detroit, has been organized to manufacture automobile accessories. Equipment has been purchased and the company will operate in leased space. C. A. Zahrndt heads the company.

John M. Hart, formerly president of the John M. Hart Co., Chicago, importer and exporter of steel wire, wire cloth, sheets, etc., is organizing a similar company whose headquarters will be in Manila, P. I., on Jan. 1, 1925. The company will be known as the John M. Hart Export Co. and will represent certain producers in the Orient and the United States.

The Andrews Machine Co., Inc., Washington Street, Auburn, Me., has been organized to operate a general machine shop, engaging in both jobbing and production machine work. It has an iron foundry with facilities for making special machinery, tools, jigs and fixtures. Recently the company completed a new fireproof building and installed equipment for handling work up to 30 in. in diameter. H. D. Andrews is treasurer.

The Merritt Co., Los Angeles, Cal., has been incorporated under Delaware laws with capital stock of $25,000,000 to manufacture concrete and reinforced concrete building materials. No definite information is available regarding principals or plans. Harry H. Hoch, Ford Building, Wilmington, Del., is corporate representative.

The Automatic Heat Corporation, Knight Building, Jacksonville, Fla., has been organized with $25,000 capital stock to act as distributor for products of the American Nokol Co., Chicago. (Oil burning equipment).

N. E. Henderson & Son, Inc., has been organized with $250,000 capital stock to operate a manufacturing and jobbing business in hardware products. It has taken over the business and properties of the company organized by Mr. Henderson in 1888. N. E. Henderson is president, N. E. Henderson, Jr., vice-president and general manager, and D. P. Gravatt, secretary. Main office is at 1320-22 Race Street, Philadelphia.

The National Grinding Co., Inc., 148 Woodridge Street, Detroit, has been organized to operate a business in salvaging milling cutters, drills and reamers. H. M. Lewis heads the company.

The Coles Calculators Corporation, 46 West Twenty-fourth Street, New York, has been incorporated with $70,000 active capital to manufacture electric-operated calculating machines and parts. Preparations are being made to get under way as soon as possible. H. B. Coles heads the company.

The Big 3 Radio Corporation, New York, incorporated with $25,000 capital stock, is making preliminary plans to manufacture and deal in wireless equipment. A. J. Clap, and M. and E. Baraban are the incorporators. I. B. Scheiber, 51 Chambers Street, is corporate representative.

The Limpert Ice Machine Corporation, New York, recently incorporated with capital stock of $250,000 will manufacture ice-making and refrigerating machinery and parts. Plans have not progressed sufficiently to warrant further announcement. S. A. and A. S. Limpert are the principals. Address in care of W. G. Ferguson, 27 Cedar Street.

The Wasco Mfg. Co., care of Milton R. Weinberger, 152 West Forty-second Street, New York, will engage in the manufacture of plumbing equipment and supplies. It is incorporated with $20,000 capital stock. Negotiations are under way for the establishment of a plant at 146 Hillside Avenue, Jamaica, L. I. W. A. Stillwagon heads the company.

The Thies Machinery & Process Corporation, 11 East Forty-second Street, New York, recently incorporated with $2,000,000 capital stock, Delaware Laws, plans to manufacture automatic dyeing and bleaching machines. Plans are yet immature. A tank manufacturer and various makers of machinery are connected with the enterprise. G. W. Steiger is president; J. C. Taylor, vice-president and plant manager, and C. G. Taylor, secretary-treasurer.

The American Hammer Corporation, 735 East One Hundreth and Fortieth Street, New York, has been incorporated with 1000 shares of no par value stock to manufacture hardware products. Present activities are being devoted to clearing away organization matters. A. C. Cory, 3rd, is treasurer.

Edwaco Co., Inc., 404 Fourth Avenue, New York, incorporated with $35,000 capital stock, will conduct a business as wholesale distributor of metal specialties. Edward L. Cowen is one of the heads.

The Gabriel Machine Co., 45 Warren Street, New York, has been organized to exploit a patent on special machinery. The machines are now being manufactured by an outside concern, but no special arrangement has been made with any firm. J. Struuck and G. Martinez are the heads.

William F. Wittel & Co., 590 Lyons Avenue, Irvington, N. J., has been organized and is making preparations to manufacture wire fence materials. The principals previously were engaged in a similar line but it will be necessary to make enlargements to the present plant. It is likely that several wire fence weaving machines also will be required. W. F. Wittell heads the company.

Jones-Davis, Inc., 2665 Main Street, Buffalo, has been incorporated as a direct sales company representing several manufacturers, including the Hendey Machine Co., Morris Machine Tool Co., U. S. Electrical Tool Co., D. H. Stoll Co., Drake Mfg. Co., O. & J. Machine Co. and the National Labeling Machine Co. The corporation will take over the business formerly conducted under the name of Lou S. Jones. Harry S. Davis is president and treasurer and Lou S. Jones, vice-president.

The Inter-Ocean Radio Corporation, 205-215 Tenth Street, Jersey City, N. J., recently organized, has rented floor space and begun operations in the manufacture of radio loud speakers and horns. William P. Horn is president.

The Independent Foundry Supply Co., First and Spruce Streets, St. Louis, has been incorporated with capital of $10,000 to manufacture foundry supplies and platers' equipment. It has factory and equipment sufficient for present needs. W. A. Bell is president.

The Reichert Float & Mfg. Co., 3140 Monroe Street, Toledo, Ohio, recently organized to manufacture solderless copper floats, has installed equipment and is in full operation. P. F. Reichert heads the company.

The "V" Tool & Die Co., 439 Fort Street, East, Detroit, has opened a fully equipped shop for manufacturing tools, dies and special machinery. A small amount of the equipment may be needed. V. H. Franz is president.

The Adgee Mfg. Co., Inc., 1188 Main Street, Bridgeport, Conn., has been incorporated with $50,000 capital stock to manufacture mechanical toys. It is still occupied with the completion of organization matters.

The Gas & Electric Appliance Co., Illinois Merchants Bank Building, Chicago, has been incorporated with $50,000 capital stock to engage in a jobbing business for the benefit of companies included in the system governed by the Illinois Power & Light Corporation of the same address. The new company is affiliated with the latter, of which Scott Brown is vice-president and secretary.

The P. W. Electric Co., Hattiesburg, Miss., has been organized as a consolidation of the Lindley Battery Co. and the P. W. Electric Co. The corporation plans to do electrical contracting on a large scale and also to manufacture and distribute storage batteries. It has two plants available. Joseph B. Ware is one of the principals.

Goldsmith-Roth, Inc., 79 Market Avenue S. W., Grand Rapids, Mich., has been organized to manufacture winter enclosures for the automobile trade. The company will do its own manufacturing and plans to turn out from 1500 to 2000 units this year. Iron and steel products, zinc, wire cloth, screws, bolts, brass goods and top material will be purchased. O. H. Goldsmith is secretary-treasurer.

The United Furnace Co., Inc., has been organized as successor to the Security Iron & Steel Co., manufacturer of furnaces, security building, St. Louis. The company owns foundries located at Belleville, Ill. M. W. Hall is secretary-treasurer.

The Groh Engine Co., care of William M. Aydelotte, California Bank Building, Los Angeles, Cal., has been organized to manufacture engines. Formal application has not yet been filed, hence further details are not available.

Industrial Notes

Herbert F. Topp & Co., Cincinnati pig iron and steel merchants, have dissolved the partnership which was organized by Herbert F. Topp nearly four years ago. A year after the organization Fred W. Lammers, then general manager Cincinnati Steel Castings Co., joined as a partner. The firm was carrying on a successful business in the sale of pig iron, coke and alloys, until the sudden death of Mr. Topp last summer necessitated a suspension of the affairs of the partnership in order to settle his estate. Mr. Lammers continued to conduct the business after Mr. Topp's death, but his desire to practice law, for which he studied several years ago, prompted him to change activities.

The British American Nickel Corporation, Ltd., Ottawa, Can., has voluntarily liquidated its affairs and closed its plant employing 500 men at Deschenes. Mining properties at Sudbury also have been closed. The action came as a result of a suit brought against the corporation by the National Trust Co. involving $6,000,000 first income bonds of the company.

The American Engineering Co. of Philadelphia announces the following representatives for the sale of its Lo-Hed monorail electric hoists: H. D. Betts, 405 South Franklin Street, Syracuse, N. Y.; C. F. Bullotti Machinery Co., 67-71 Main Street, San Francisco; A. G. Cary, 410 Endicott Building, St. Paul; Chatard & Norris, 206 Water Street, Baltimore; Colwell & McMullin, Park Square Building, Boston; Coon-DeVisser Co., 1772 West Lafayette Boulevard, Detroit; H. D. Conkey & Co., 605 Chamber of Commerce Building, Chicago; Dravo-Doyle Co., Dravo Building, Pittsburgh; A. Q. Dufour, Merchants and Manufacturers Bank Building, Milwaukee; Florandin Equipment Co., 110 West Fortieth Street, New York; Fulton Engineering Co., 612 American Bank Building, San Francisco; S. A. Gilliard, 405 Liberty Building, Buffalo; E. C. Horne Machinery Co., 1751 Wazee Street, Denver; J-B Engineering Sales Co., New Haven; Lyman Tube & Supply Co., Montreal; J. R. Purser, 406 Commercial Bank Building, Charlotte, N. C.; Seeger Machine Tool Co., 260 Luckie Street, Atlanta; Solon Jacobs & Co., 430 South Twentieth Street, Birmingham, Ala.; P. E. Wright Engineering Co., 2012 L. C. Smith Building, Seattle.

Edward H. Bair has retired from the engineering department Kidwell Boiler Corporation, Milwaukee, to engage in sales engineering as manufacturers' representative of the following-named concerns: Permutit Co., Combustion Fuel Oil Burner Co., Audiffren Refrigerating Machine Co., and Autovent Fan & Blower Co. Offices have been established at 1143 Wells Building, Milwaukee.

Trade Changes

The Remo Mfg. Co., Meriden, Conn., maker of safety pins, has sold its business, machinery, equipment and material to the Risdon Mfg. Co., Naugatuck, Conn., which will move the business to Naugatuck, where it owns and operates the Novelty Co.

The Harry Benjamin Equipment Co., St. Louis, announces the removal of offices to 707-710 Buder Building (formerly Pontiac Building), northwest corner of Seventh and Market Streets.

The Cincinnati Shaper Co. and its subsidiary, the Cincinnati Gear Cutting Machine Co., have appointed Frank T. Goetz, sales engineer, as direct representative in the Cleveland territory, with offices at 314 National Building. K. H. Crumrine, formerly with the Gisholt Machine Co. and later works manager of the Milholland Machine Co., also has joined the organization of the Cincinnati Shaper Co.

A syndicate has purchased the factory in Cleveland where the Winton automobile formerly was manufactured. Sale of the factory brought $500,000 and is the first step in a plan to liquidate the Winton company, a pioneer in the industry.

The National Acme Co. has planned to abandon its machinery plant in Stanton Avenue, Cleveland, where its automatic machines were made. The machinery will be moved to the Coit Road plant and operated in conjunction with the products department.

E. Woodings, recently with Hubbard & Co., Pittsburgh, and previously for 37 years identified with the Verona Tool Co., Verona, Pa., is president of the Woodings Forge & Tool Co., Verona, Pa., which has bought the plant of the Valley Forging Co., and will continue the lines of the latter company, which embraced track tools and car forgings. Plant improvements, including new equipment purchases, are planned by the new company.

The Standard Gauge Steel Co., Beaver Falls, Pa., announces the appointment of the Steel Sales Corporation, 823 Book Building, Detroit, as direct and exclusive representative in the Detroit territory.

The Bassick-Alemite Corporation, Chicago, has purchased the Allyne-Zerk Co., Cleveland, manufacturer of high-pressure lubricating systems, and will operate it as an independent unit, but under the same general management as the other seven companies controlled by the corporation. E. W. Bassick, president of the corporation, is chairman of the executive committee which directs the policies of the organization. E. S. Evans, president E. S. Evans & Co., Detroit, has been made vice-president and general sales manager in charge of the sales of all units of the corporation

President W. T. Robertson of the W. T. Robertson Steel & Ice Co., Cincinnati, states that he will take over the sign and metal can department of the Elwood Myers Co. and operate it. He purchased the machinery, equipment and raw material in this department of the Myers company at private sale from receivers Harlan C. West and Louis E. Bauer. Mr. Robertson also has small plants in Marietta and Madison, Ind.

The S. & S. Machine Works is moving to its new building at 4539-41 West Lake Street, Chicago.

Commencing Aug. 21, the name of the Electric Furnace Construction Co., Philadelphia, will be changed to the General Furnace Co.

The Albaugh-Dover Co., Chicago, has changed its name to the Albaugh-Dover Mfg. Co.

The business and equipment of the Keystone Car & Equipment Co. have been purchased by the Conley Tank Car Co., thereby acquiring 260 standard steel tank cars.

Address of the Hercules Mfg. Co., Detroit, has been changed from 446 East Woodbridge Street to 1314 Maple Street.

Machinery Markets and News of the Works

LARGE JAPANESE PURCHASES

Mitsui & Co. Place Orders for Fully $500,000 Worth of Tools

Machines Are for Shibaura Engineering Co., Electrical Manufacturer—List of Salisbury Axle Co. Excites Interest

FULLY $500,000 worth of machine tools have been purchased within the past few days by Mitsui & Co. of New York for its client, the Shibaura Engineering Co. of Japan, which is affiliated with the General Electric Co. of this country. While this business has been expected for some weeks, its actual consummation has brought about a greater note of optimism in machine tool circles than has recently prevailed. A considerable portion of the business went to the Niles-Bement-Pond Co., New York.

Of scarcely less importance is the inquiry of the Salisbury Axle Co., Jamestown, N. Y., mentioned in THE IRON AGE last week, which is for 95 tools, many of them of large size. It is stated that the Salisbury orders will be forthcoming shortly, as the company has a contract for early delivery of axles to two motor car companies.

In other machine-tool selling centers business continues quiet. The principal item of interest in Chicago is the pending list of the Chicago Board of Education for a considerable list of tools, including 59 lathes, for the Crane Technical High School. The Board of Education has sent out inquiries also for a number of tools for other manual training departments.

Buying by the automobile industry is of relatively small proportions and the railroads are placing only a few orders. The Santa Fe has bought two axle lathes. The Nickel Plate list is still pending.

Improvement in machine tool business in July over June is indicated by the figures collected by the National Machine Tool Builders' Association. The percentage of orders, referred to the first quarter of 1920 as a base, showed 17.5 per cent as many as for that period, against 16.17 per cent in June. In none of the preceding four years has the July volume been better than that of June, though it is to be remembered both June and July of this year are notably lean months.

New York

NEW YORK, Aug. 19.

ALTHOUGH general machine-tool buying has shown only slight improvement, if any, the purchase by Mitsui & Co. of New York of about $500,000 worth of machine-tool equipment on behalf of the Shibaura Engineering Co. of Japan, a large electrical manufacturer affiliated with the General Electric Co., has created a note of optimism that recently has been lacking. The orders placed by Mitsui & Co. were distributed among a number of machine-tool builders, but a considerable portion of the business, close to $200,000 worth, went to the Niles-Bement-Pond Co.

The list of the Salisbury Axle Co., Jamestown, N. Y., mentioned in THE IRON AGE last week, totaling 95 tools, is expected to be bought soon, as the company has a contract for early delivery of axles to the Paige and Jewett motor car companies. The Salisbury Axle Co.'s list calls for boring mills, engine lathes, grinding machines and special axle tools.

Among other purchases made in the past week by railroads and industrial users of machine tools are two axle lathes by the Atchison, Topeka & Santa Fe; a 6-ft. radial drill by the Ingersoll-Rand Co. and a 12-ft. plate bending roll by the Oil Well Supply Co., Pittsburgh.

A grinding machine and a polishing machine suitable for hand saws are wanted by John Elsworth & Sons, Ltd., Australian Works, Sheffield, England. The first named machine must be capable of grinding two or three gages thin to back, also reducing in thickness from heel to point.

The Superintendent of Lighthouses, Staten Island, N. Y., will take bids until Sept. 8 for 300 seamless steel acetylene cylinders, 180-ft. capacity, complete with porous fill and solvent, proposal 17614; also, until Aug. 28, for 8 acetylene buoys with bells, proposal 17604.

The Universal Shock Eliminator Co., 7 West Sixty-first Street, New York, manufacturer of shock absorbers, etc., for automobiles, has leased a one-story building at the northwest corner of Fourteenth Street and Vernon Avenue, Long Island City, totaling about 44,000 sq. ft., and will equip for a new plant. The lease is for a term of years and aggregates $150,000.

The Argentine National Sanitation Works Department, Buenos Aires, Argentina, is asking bids until Oct. 6 for equipment for a hydroelectric generating plant to be constructed at Mendoza, comprising horizontal turbines, 3-phase generators, switchboard and accessory equipment, as per specifications on file.

A one-story service, repair and garage building for company motor trucks and cars will be erected by the Brown-Baily Condensed Milk Co., 90 Third Avenue, Brooklyn, at Butler and Nevins Streets, in conjunction with a two-story building for other service, estimated to cost $60,000. A general contract has been let to the William Kennedy Construction Co., 215 Montague Street, Brooklyn.

The Board of Supervisors, Mineola, L. I., will build a power plant at the proposed local court house and jail building, for which a general contract has been awarded to John D. Cosgrove, Mineola.

The Nutractor Motor Co., Long Island City, recently organized, has leased a one-story factory on Crescent Street, owned by Schering & Glatz, 150 Maiden Lane, New York, drugs, for a term of years. The new owner will equip for an automobile works, and will occupy at an early date.

The American Power & Light Co., 71 Broadway, New York, operating utility properties in Kansas, Iowa, Nebraska, Washington and other States, is disposing of a bond issue of $5,000,000, a portion of the proceeds to be used for expansion and improvements. C. E. Groesbeck is president.

The Foreman & Clark Mfg. Co., 85 Fifth Avenue, New York, clothing, is said to be planning the construction of a power house at its proposed two-story factory, 138 x 325 ft., at Watervliet, N. Y., estimated to cost $250,000 with equipment.

The Swedish Chamber of Commerce of the United States, 2 Broadway, New York, has received an inquiry from a company in Sweden, in the market for a quantity of machinery and tools for the manufacture of children's vehicles, doll carriages, etc.

John De Hart, 1039 Fox Street, New York, architect, has filed plans for the erection of a two-story automobile service, repair and garage building, 165 x 216 ft., estimated to cost $110,000, at Burnside and Sedgwick Avenues.

Officers of the American Car & Foundry Co., 165 Broadway, New York, have organized the Dow Transmission Corporation with Alexander Dow, to manufacture and deal

The Crane Market

THE slight improvement manifest in most lines of business in the past week or two has not yet penetrated to the market on locomotive and electric overhead traveling cranes. Competition is still exceedingly keen on the few inquiries that are current and new inquiries are only occasional. The Brooklyn & Manhattan Transit Corporation, Brooklyn, N. Y., is expected to take action on the 25-ton and 15-ton overhead cranes, under inquiry, some time this week. Purchase of the two 10-ton overhead cranes asked for by the American Smelting & Refining Co. for Baltimore, is not expected for several weeks. The Department of Street Cleaning, City of New York, will open bids Aug. 25 on twenty-five 1½-ton hoists and trolleys. The Pennsylvania Railroad, Philadelphia has closed on two 100-ton crane bridges.

While there have been no important awards announced in the Chicago district in the past week, inquiries have become more active and buying is expected to develop soon. Among prospective purchasers are iron and steel manufacturers as well as general industrial users. The railroads continue to buy cautiously, but it is believed that they too will come into the market more actively.

Among recent purchasers are:

Hormiguero Central Corporation, 63 Wall Street, New York, a 35-ton, 33-ft. span hand power crane with two 18-ton trolleys, from Maris Brothers.

Interborough Rapid Transit Co., New York, four 25-ton, 66-ft. span electric traveling cranes, from an eastern crane builder.

West Virginia Pulp & Paper Co., 200 Fifth Avenue, a 10-ton, 46-ft. span hand power crane, from Maris Brothers.

American Ship Building Co., Cleveland, a double-leg gantry crane for its Lorain yards, from the Wellman-Seaver-Morgan Co.

Universal Portland Cement Co., Buffington, Ind., three 15-ton, 100-ft. span electric traveling bucket handling cranes, to Pawling & Harnischfeger Co., Milwaukee.

in transmission systems and equipment for automobiles. The initial capital will be 1000 shares of stock, no par value.

The Ware Radio Corporation, 529 West Forty-second Street, New York, has arranged to double its plant capacity for the manufacture of radio sets and instruments and purposes to develop the increased schedule early in the fall.

The South Indian Railway, Calcutta, India, has made application to the Home Board for India for authority to electrify different lines in the vicinity of Madras City, to include the installation of power station machinery, line equipment, automatic power substations, etc. Robert White & Partners, London, England, consulting engineers, have prepared estimates of cost for the project. The American Consulate, Calcutta, is familiar with the enterprise.

William F. Doyle, 11 John Street, New York, architect, will begin the construction of a two-story automobile service, repair and garage building, 100 x 282 ft., on Jerome Avenue, near Burnside Avenue, to cost approximately $250,000 with equipment.

The Washburn Wire Co., East 118th Street and the Harlem River, New York, has awarded a contract to the Link-Belt Co., Nicetown, Philadelphia, for conveying and other equipment for a one-story coal bunkering building at 528-30 East 118th Street, estimated to cost $21,000.

The Erie Railroad Co., Pavonia Avenue, Jersey City, N. J., has plans for a one-story power house at its yards on Ninth Street, to cost approximately $75,000. Graham King is company architect.

A one-story automobile service, repair and garage building for company motor trucks and cars will be erected by the Orange Dairy Co., 20 Main Street, Orange, N. J., in connection with a new bottling and pasteurizing plant on North Jefferson Street, estimated to cost $35,000. W. Frank Bower, 439 Main Street, East Orange, N. J., is architect.

The Bi-Metallic Radio Parts Corporation, Newark, N. J., recently organized, has taken over the plant and equipment of the Newark Engineering & Tool Co., 476 Eighteenth Avenue, recently purchased by the R. Robinson Co., 83 Barclay Street, which will operate the new organization. The plant will continue in the line of saw and filing machine production, with the manufacture of radio equipment and parts.

E. I. du Pont de Nemours & Co., Newark, N. J., have filed plans for the construction of a one-story power house at their local plant, 256 Vanderpool Street, to cost approximately $25,000.

The Kay White Products, 295 Badger Street, Newark, N. J., is in the market for 75 and 100-hp. boilers, used, in good condition.

Edward M. Adelsohn, 1778 Pitkin Avenue, Brooklyn, architect, is completing plans for a two-story automobile service, repair and garage building, 100 x 100 ft., at Union and Portal Streets, to cost $100,000 with equipment.

Philadelphia

PHILADELPHIA, Aug. 19.

CONTRACT has been awarded by the Cutter Electrical & Mfg. Co., Nineteenth and Hamilton Streets, Philadelphia, manufacturer of electric switches, etc., to the John N. Gill Construction Co., 121 North Broad Street, for the erection of a new plant addition, estimated to cost $50,000.

The Harman Bleachery Co., Wilmington, Del., plans for the construction of a power house at its proposed plant on site recently acquired at the State Road and Rhawn Street, Philadelphia, estimated to cost $250,000.

Merger plans are said to be in progress between the Philadelphia Electric Co., the United Gas Improvement Co., both of Philadelphia, and the Public Service Corporation, Newark, N. J., the latter operating as well at Trenton, N. J., and vicinity. The proposed consolidation will include a large increase in capitalization, with expansion of electric generating plants and transmission systems.

The Foreign Trade Bureau, Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry (42548) from Augusto Marin, P. O. Box 125, Aguadilla, Porto Rico, in the market for laundry machinery, grinding mills and coffee roasters, electrically-operated; also, an inquiry (42535) from the American Traders of New Zealand, Ltd., 15 Queen Street, Auckland, New Zealand, desiring to be placed in touch with American manufacturers of builders' hardware, including door locks, window fasteners, hinges, etc; an inquiry (42540) from C. C. Debrot, Maracaibo, Venezuela, desiring to get into contact with an American manufacturer of metal name plates, especially metal enameled plates; an inquiry (42542) from Herrera Hnos, S. en C., 5a De Tacuba 31, Mexico City, Mexico, in the market for a quantity of American machinery for the manufacture of soap; and an inquiry (42549) from Alanis Hermanos, Zaragoza 137, Saltillo, Coahuila, Mexico, interested in butchers' machinery.

M. Kelley's Sons, 4036 Poplar Street, Philadelphia, operating a general machine and repair works, have taken out a permit to erect a one-story machine shop addition, for which a general contract has been awarded to Harry G. Walter, 412 North Fortieth Street.

The Board of Trustees, Germantown Dispensary and Hospital, Germantown, Philadelphia, has had plans drawn for a one-story power house at the institution, to cost in excess of $50,000, with equipment. Arthur H. Brockie, 254 South Fifteenth Street, is architect.

Maderia, Hill & Co., Philadelphia, coal operators, have acquired the former anthracite coal mines of the Buck Ridge Coal Co., near Shamokin, Pa., and are said to be planning for improvements and replacements in equipment, with the installation of additional apparatus. It is purposed to place the mines in operation at an early date.

The Luzerne County Gas & Electric Co., Kingston, Pa., is perfecting plans for the construction of its proposed steam-operated electric power plant on site acquired recently in the vicinity of Hunlock Creek, estimated to cost $5,000,000, with transmission system.

The Traylor Engineering & Mfg. Co., Allentown, Pa., manufacturer of mining and smelting machinery, crushers, etc., has work in progress on an addition to its plant, including the installation of equipment in the boring mill department and other work, to cost in excess of $125,000. The company is arranging for the establishment of a branch plant in Germany, and Samuel W. Traylor, president, has left for that country to consummate plans for building.

The Cumberland Electric Co., Hogestown, Pa., now being organized by local interests, has preliminary plans under advisement for the installation of a power plant at Mechanicsburg, near Hogestown, for light and power service in this section.

The Harrisburg Foundry & Machine Works, Harrisburg, Pa., now being operated under the direction of Howard M. Bingaman, receiver, has concluded negotiations with A. L. Ide & Sons, Springfield, Ill., manufacturers of steam engines, to take over the production end of their business. The local plant will be expanded to accommodate the increase, with

an advance of about 20 per cent in present working force. The Ide works, destroyed by fire several weeks ago, will not be rebuilt, it is stated, at the present time.

The Central Railroad of New Jersey, 143 Liberty Street, New York, has preliminary plans under way for the construction of an engine house and locomotive repair shops on site selected in the West Side district, Bethlehem, Pa.

The Edison Light & Power Co., York, Pa., has acquired the Glen Rock Electric Light & Power Co., Glen Rock, near York, and will take over the property at an early date. Plans are under way for extensions and improvements, with the installation of additional equipment. The purchasing company proposes to consolidate the organization with a subsidiary utility interest operating in this same section.

The Bucks-Bristol Electric, Bucks-Falls Electric, Bucks-Bensalem Electric and Bucks-Middletown Electric companies are being organized by the same interests, to install and operate electric power plants and systems in Bristol, Falls, Bensalem and Middletown townships, respectively, in Bucks County. The new companies are represented by Hause, Evans & Baker, Harrisburg, attorneys.

The Reading Sheet Metal Products Co., Front and Chestnut streets, Reading, Pa., is in the market for a buffing machine.

Cincinnati

CINCINNATI, Aug. 18.

SINGLE tool orders continue to be booked by machine-tool manufacturers but the volume of business is not by any means heavy. The Navy Department is expected to place orders for 12 lathes this week and some railroad buying from the Chicago district is expected to come to a head. There has been an improved demand for heavier type of machines, but buyers are taking their time in closing. This naturally is the case during the month of August, so while there is little satisfaction in the amount of business being booked at present, there is no lack of optimism for the future. Production schedules of four days per week continue to be maintained in many of the larger shops, with some of the smaller manufacturers working full time with slightly reduced forces. Local dealers continue to book a fair volume of orders for small tools and accessories and the demand for used machinery is steady. A strengthening of prices is reported, a nearby lathe manufacturer having announced an advance of 5 per cent.

Decision to rebuild the plant of the Standard Slag Co., destroyed by fire at Jackson, Ohio, recently, has been reached. A steel structure probably will be built. W. E. Bliss is vice-president and general manager.

The Gardner & Harvey Co., paper manufacturer, Middletown, Ohio, has let contract for the erection of a new factory and warehouse building for the paper carton division. Paper making and printing machinery will be installed. E. T. Gardner is president.

The Ward Railway Equipment Co., Lima, Ohio, which recently increased its capitalization from $50,000 to $250,000, has leased, with the privilege of purchase, the foundry building of the Bernhard Boiler Co., Lima, and will shortly commence the manufacture of its product, which eventually is to cover a wide range of equipment for railroad companies.

The Miller Machine & Mould Works, Columbus, Ohio, will erect a one-story steel warehouse, 40 x 60 ft., thus releasing for machine shop purposes the present building used for storage purposes. The company manufactures bottle molds and will install additional equipment in the new machine shop. Edward Miller is president.

Preliminary surveys are being made by the H. M. Byllesby Co., Chicago, for the erection of a hydroelectric power plant at Louisville, Ky., for the Louisville Hydro-Electric Co. The survey will be completed this fall and it is expected that if Government sanction for the project is obtained work will commence early next spring.

The Dayton Malleable Iron Co., Dayton, Ohio, has awarded contract to Frank Hill-Smith, Inc., for the erection of a powdered coal building to cost $50,000.

A powder explosion at the plant of the Nashville Industrial Corporation, Old Hickory, Tenn., destroyed about 45,000,000 lb. of powder in storage there. The fire was confined to the area reserved by the United States Government for the storage of powder and powder-making machinery. The Nashville Industrial Corporation advises that the loss on the machinery and equipment it has been offering for sale was very small, only a few ice machines being damaged. The business of the corporation is being continued as usual.

The Premier Rubber Mfg. Co., Michigan and Edmund Streets, Dayton, Ohio, manufacturer of molded rubber and mechanical rubber products, has taken title to property in the vicinity of its plant as a site for a new three-story mill, 65 x 125 ft., estimated to cost $250,000 including machinery. Plans will be drawn in the near future.

The Pennsylvania Railroad Co., Pittsburgh, is said to have arranged an appropriaion of $500,000 for the construction of an engine house with repair shops at the site of its present roundhouse, vicinity of East Broadway and Oak Street, East Toledo, Ohio. The ultimate works are expected to cost $1,000,000 with equipment.

The Columbian Iron Works, 2511 Chestnut Street, Chattanooga, Tenn., has purchased the plant and equipment of the Continental Machinery Co., Missionary Avenue, including a tract of about 10 acres. Plans are under way for the construction of a new works, to be built on the unit plan, with the removal of present equipment to the new structures and installation of considerable additional machinery. The company will specialize in the manufacture of fire hydrants, sprinklers and kindred equipment and will operate a large iron foundry.

The Buckeye Products Co., 919 West Fifth Street, Cincinnati, manufacturer of foundry facings and supplies, has awarded a general contract to the D. Meinkin Co., 2145 Barnard Street, for the construction of a new two-story plant on Carthage Street, near Seventy-first Street, estimated to cost $80,000 including equipment. Rediga, Panzer & Martin, Southern Ohio Bank Building, are architects.

Alexander M. Robinson, Georgetown, Ky., machinery dealer, has inquiries out for a Corliss engine, about 28 x 48 in., with accessory equipment.

Officials of the Signal Mountain Portland Cement Co., Chattanooga, Tenn., have organized a subsidiary company to be known as the Signal Mountain Sand & Gravel Co., capitalized at $250,000. The new company plans for the development of extensive sand and gravel properties in this section, and will install digging, conveying, hoistng and other machinery, including traveling cranes. John L. Senior is president, and J. P. Hoskins, treasurer. A. C. Deer, manager of the parent company, 1007 East Fifth Street, will be in charge of plant installation and operation.

The D. S. Etheridge Co., Inc., Third and Broad Streets, Chattanooga, Tenn., automobile dealer, has preliminary plans under way for the erection of a three-story service, repair and garage building, estimated to cost $250,000 with equipment. The present works will be removed to the new location and this site given over to a plant for the reconditioning of automobiles.

The Black Motor Co., Harlan, Ky., is reported in the market for a cylinder reboring machine, lathe, drill press, electric motors and other equipment for installation in a new two-story garage and service station, now under construction.

Manual training and vocational equipment will be required for a new high school at Dillonvale, Jefferson County, Ohio, for which bids were received on a general contract Aug. 12.

Chicago

CHICAGO, Aug. 18.

WITH orders and inquiries on a moderate scale, the machinery trade in this district is principally interested in the pending award of the large list for Crane Technical High School. The list includes 59 lathes and the award is expected to be made within a few days. A committee from the Chicago Board of Education has visited different dealers and had them give a demonstration of the operation of their equipment. The Board of Education has issued a list of four 14-in. x 5-ft. geared head motor lathes for the Carl Schurz High School. Bids will be opened tomorrow. The board also has issued a list calling for three 6-in. x 24-in., between centers, motor head lathes, Wallace, or equivalent, button control for the Phillips Junior High School. These bids also will be opened tomorrow. The Santa Fe has placed an additional small amount of the equipment included on its large list. The latest order includes an axle and a coach wheel lathe.

The Twyman Re-Manufacturing Motor Co., Indianapolis, tomorrow will auction off the entire equipment of its plant for the remanufacture of automobiles. The list includes

body and sheet metal machinery, machine tools and other equipment. The auctioneers are Gordon & Winternitz, Chicago.

The American Steel & Wire Co. has placed a contract with Freyn, Brassert & Co., Chicago, for installation of a Brassert washer at its "A" furnace, Central Works, Cleveland.

The Appleton Train Control Co., 108 South LaSalle Street, Chicago, recently incorporated, will manufacture train control devices at a leased plant. The officers are Russell B. Appleton, president; Arch Nulty, vice-president and treasurer; Arthur Nulty, secretary.

The Great Lakes Forge Co., 14 East Jackson Boulevard, Chicago, has awarded a general contract to Charles B. Johnson & Son, 111 West Washington Street, for the erection of a one-story forging plant, 100 x 600 ft., at Racine and 119th Streets, estimated to cost $100,000 with equipment. C. C. Hodgson is president.

The Common Council, Potter, Neb., has authorized the purchase of the local electric light and power plant of the Farmers Grain & Milling Co., to be operated in the future as municipal property. Plans are under way for enlargements, to include the installation of a complete new unit.

Bids will be received by the City Council, Ackley, Iowa, until Aug. 28, for one 125-kw. engine-generator set, direct-connected, direct current engine, with switchboard and accessory apparatus. The Charles L. Pillsbury Co., Minneapolis, Minn., is engineer. John Heinz is city clerk.

The Fire Protection Co., 419 West Eighteenth Street, Chicago, manufacturer of fire-fighting equipment, is considering preliminary plans for the construction of a new two-story plant at Forty-seventh Avenue and Fourteenth Street, Cicero, Ill., to cost approximately $200,000 with equipment.

The Minnesota Sugar Co., 416 Grove Street, Minneapolis, Minn., has tentative plans under way for the erection of a new beet sugar refining plant at East Grand Forks, Minn., with power house, machine shop and other buildings, to cost in excess of $600,000 with machinery. H. A. Douglass is president.

The Twin City Steel Mfg. Co., 2652 Thirty-fourth Avenue South, Minneapolis, Minn., intends to purchase an 8-in. Landis pipe threading machine.

Pittsburgh

PITTSBURGH, Aug. 16.

A FAIR volume of orders for individual tools is coming out in this district but action against the several important lists which have been before the trade for some time still is deferred. The market is generally described as quiet, and while the hope is that the fall will bring more activity, the present condition is that buyers do not seem disposed to spend much money. Prices are being watched carefully, and a tendency to "play" one manufacturer against another is as marked as it usually is when business is dull and competition for orders is keen. Crane orders are few and so also are inquiries.

The University of Pittsburgh has plans under way for the construction of a stadium which will eventually hold 90,000 people, the initial seating capacity to be 40,000. This stadium will be completely enclosed in the shape of a three centered oval and will be built of steel and reinforced concrete. W. S. Hindman, 1898 graduate from the University of Pittsburgh, is the designing engineer in general charge and the construction will be carried out under the supervision of Stone & Webster, Inc., 147 Milk Street, Boston.

The Wilson-Snyder Mfg. Co., Pittsburgh, has obtained an order from the Pan American Petroleum Co. of Los Angeles for ten pipe line pumps for its California field. Each pump is to have a capacity of 15,000 bbls. per day against 750 lb. per sq. in. line pressure and is to be driven by a 300 b.hp. Diesel engine.

The Board of Allegheny County Commissioners, Court House, Pittsburgh, has awarded a general contract to J. H. Felterman, Park Building, for the erection of a one-story addition to its boiler and mechanical repair shops at Parkview, Pa., for which foundations will be laid at once. V. R. Covell is county engineer, in charge.

The Perry Township Electric Co. is being organized by G. E. Murrie and A. M. Mitchell, Pittsburgh, to install and operate a power plant and system in Perry Township, Clarion County. M'Cahill, M'Cahill & Tabor, 908 West Penn Building, attorneys, represent the company.

F. Lory & Sons, Charleston, W. Va., have inquiries out for a hydraulic press, power-operated, with dies, etc., to be used for the forming of plastic materials.

The plant and property of the Mack Mfg. Co., New Cumberland, W. Va., manufacturer of brick and kindred products, have been acquired at a receiver's sale by Walter Bonitz and Pittsburgh interests, for a consideration of $350,000. The new owners plan for an immediate reorganization of the company, with extensions and improvements in the works, which will be placed in service at an early date.

The City Council, Martinsburg, W. Va., is considering tentative plans for a municipal electric light and power plant and will secure estimates of cost at an early date. A bond issue will be arranged to finance the project.

The Manufacturers' Light & Heat Co., Columbia Bank Building, Pittsburgh, is arranging an appropriation of close to $1,000,000 for the construction of its proposed pipe line in Wetzel County, W. Va., for which it is expected to begin work at an early date. Booster stations will be installed.

Hoisting and conveying equipment, factory trucks and other freight handling machinery will be installed in the new freight station and warehouses to be constructed by the Norfolk & Western Railroad Co., Roanoke, Va., at Bluefield, W. Va., estimated to cost $1,000,000. A general contract for the buildings has been let to the John P. Pettyjohn & Co., Lynchburg, Va. N. P. Wiltsee is chief engineer.

New England

BOSTON, Aug. 19.

BUSINESS in the machine-tool market the past week was at a standstill. Here and there a sale of a used tool was made, the aggregate in this market falling short of ten machines. The sale of a fairly large milling machine to a central Massachusetts shop was the most important transaction. Sentiment in machine-tool circles is optimistic, the dullness notwithstanding. Inquiries for single standard and special production tools are on the mend. Most buyers are waiting for signs of business revival before placing orders, however. Prices on new equipment are firm and, if anything, tending upward. Supplies of good used tools are small and dealers' ideas of values are strengthening. It is confidently felt by a majority of the trade that the movement of machinery will increase shortly after the turn of the month. Little local interest is evinced in the sale of the Herreshoff Mfg. Co., Inc., Bristol, R. I., metal working equipment Aug. 21 and 22. A local house has completed negotiations for the purchase of considerable equipment used in an eastern Massachusetts plant of a machinery manufacturer. Nearly 100 tools are involved, and their purchase indicates the confidence in the future of one of the largest dealers.

Bids are in for a one-story, 51 x 175 ft. garage at Waltham, Mass., and a one-story, 100 x 60 ft., garage at Stoneham, Mass., for the Standard Oil Co. of New York, 26 Broadway, New York.

Bids closed last Saturday for a one-story, 31 x 55 ft., manufacturing plant on Southbridge Street and Quinsigamond Avenue, Worcester, Mass., to be built by the Worcester Lunch Car Co., 390 Main Street, that city. Jasper Rustigan, 405 Main Street, is the architect.

The Travers Mfg. Co., 146 Chambers Street, New York, children's carriages, contemplates the rebuilding of its Templeton, Mass., plant at a cost of $100,000 including equipment. The architect has not been selected.

On or about Sept. 17, plans will be ready for a $100,000 coal pulverizing plant to be put up by the Narragansett Electric Light Co., Providence, R. I. Early next year the company will instal turbine equipment. Jenks & Ballou, 10 Weybosset Street, Providence, are the engineers.

Fred T. Ley Co., Inc., Springfield, Mass., has the general contract for a hydroelectric plant at Hoosac Falls, N. Y., for the Twin States Gas & Electric Co., State Street, Boston.

The Central Vermont Railway Co., St. Albans, Vt., has awarded a contract to the Roberts & Schaffer Co., Chicago, for the construction of a one-story mechanical coaling plant at Brattleboro, Vt., estimated to cost $55,000.

The Tyson Motor Sales Co., Greenwich, Conn., has awarded a general contract to the Vuono Construction Co., Greenwich, for the erection of one-story service, repair

and sales building, 60 x 151 ft., on the Boston Post Road, estimated to cost $45,000. Frank Urso, Spelke Building, Stamford, Conn., is architect.

The Rhode Island Malleable Iron Works, Hillsgrove, R. I., has awarded a general contract to the C. I. Bigney Construction Co., 184 Washington Street, Providence, R. I., for the erection of a one-story foundry, 122 x 140 ft., to cost approximately $57,000. The same contractor will make improvements and alterations in the existing works, for which contract recently was let.

The Board of Education, Lynn, Mass., plans for the installation of a manual training department in its proposed high school, estimated to cost $500,000.

A. N. Adams, 86 Everett Street, Boston, architect, is preparing plans for a two-story automobile service, repair and garage building, 100 x 200 ft., estimated to cost $130,000, with equipment.

The E. Ingraham Co., Bristol, Conn., manufacturer of clocks, clock movements, etc., is planning for the erection of an additional story at its plant, 62 x 200 ft. Other extensions will also be made, including the construction of a one-story extension, 80 x 80 ft.

The Board of Education, Thompsonville, Conn., plans for the installation of manual training equipment in the porposed two-story and basement high school, estimated to cost $250,000, for which bids will be asked at once on a general contract to close about Sept. 2. The Frank Irving Cooper Corporation, 983 Main Street, Hartford, Conn., is architect.

The Sanford Garage Co., Sanford, Me., has work in progress on a two-story addition to its service, repair and garage building, 35 x 100 ft., estimated to cost $100,000, with equipment.

Buffalo

BUFFALO, Aug. 19.

THE situation has taken a turn for the better and sellers are very much encouraged. More inquiries have come out during the week for new machines and business has quickened all through the western part of the State. New equipment has been purchased by the Prosperity Co., Syracuse, N. Y., which has just moved into its new plant, and the Syracuse Board of Education will close shortly on several new lathes, milling machines and shapers for manual training departments. The American Radiator Co. plans the purchase of new equipment for its malleable plant, according to a current report. The New Process Gear Co., maker of motor transmissions, is starting on larger production. A contract for 350 reversible gear motors has been awarded the Sterling Engine Co., Buffalo, by the Government. These engines will be placed in 75-ft. cruisers to be used to enforce the prohibition laws on the Atlantic Coast and the Great Lakes.

Plans have been filed by the Worthington Pump & Machinery Corporation, Clinton and Roberts Streets, Buffalo, for the erection of two new buildings, each two-story, estimated to cost $45,000.

The Rich Ice Co., 470 Spring Street, Buffalo, has awarded a general contract to Metz Brothers, 1295 Fillmore Avenue, for the erection of a two-story automobile service and repair building, 60 x 130 ft., on Pratt Street, for company motor trucks and cars, estimated to cost $50,000 with equipment.

Plans are being prepared by the Vendome Realty Co., 1012 Marine Trust Building, Buffalo, for the construction of a six-story automobile service, repair and garage building, 150 x 195 ft., on Ellicott Street, estimated to cost $200,000 with equipment. The structure has been leased to an automobile company whose name is temporarily withheld.

The New York Central Electric Corporation, Perry, N. Y., is disposing of a bond issue of $2,100,000, a portion of the proceeds to be used for the acquisition of properties at Canisteo and Canaserga, N. Y., and for extensions and betterments in power plants and system. E. L. Phillips is vice-president.

Manual training equipment will be installed in the proposed junior high school addition to be erected on Main Street, Little Falls, N. Y., estimated to cost $250,000, for which plans are being drawn by Tooker & Marsh, 101 Park Avenue, New York, architects.

The Board of Trustees, Attica, N. Y., will take bids until Aug. 28 for pumping machinery, stand pipe and accessory mechanical equipment for installation at the municipal waterworks. Hopkins & Field, Cutler Building, Rochester, N. Y., are engineers. Harry M. Morgan is president.

Plans have been filed by John E. Roberts & Son, 1284 East Second Street, Jamestown, N. Y., for the construction of a one-story machine shop on Hopkins Avenue to cost $20,000 exclusive of equipment.

A general contract has been awarded by the S. A. Day Mfg. Co., 1483 Niagara Street, Buffalo, N. Y., for the construction of a one-story addition. The company manufactures platers' equipment and supplies.

Plans have been filed by the North Buffalo Hardware & Foundry Co., 743 Hertel Avenue, Buffalo, N. Y., for the construction of a one-story steel addition, 60 x 68 ft., to be equipped as a repair shop.

Manual training and vocational departments will be installed in connection with a new school to be erected at Ogdensburg, N. Y., for which the local board of education is arranging to float a bond issue of $137,000.

The George L. Maltby Motor Car Co., Jamestown, N. Y., organized by George L. Maltby, formerly general superintendent, Jamestown, Westfield & Northwestern Railroad Co., has acquired property at Fifteenth and Washington Streets upon which it is planned to erect a two-story garage and service station for Pierce-Arrow motor cars and trucks. A cylinder reboring machine, lathe, drill press, grinder and electrical equipment will be required.

Cleveland

CLEVELAND, Aug. 18.

MACHINERY dealers are getting a moderate volume of single tool orders and in this respect the market is better than in July. However, no inquiries are coming out for more than two or three machines at the most and not a great deal of improvement is looked for until the metal working industries are more fully employed than at present. There is some demand from manufacturers of plumbers' brass goods and from other industries affiliated with the building field. No new inquiries have come from the railroads and the Nickel Plate Railroad has not yet placed orders against its recent list. Buying by the automotive industry is limited to single machines, the demand from this source being very little at present.

The Champion Spark Plug Co., Toledo, will erect a one-story plant addition 160 x 65 feet to be used for warehouse purposes. Mills, Rhines, Bellman & Nordhoff, Ohio Building, Toledo, are the architects.

The Cleveland Railway Co., Hanna Building, Cleveland, has had preliminary plans prepared for a two or three-story garage, to be built at an estimated cost of $150,000. The Watson Co., 4614 Prospect Avenue, is the architect.

A manual training department will be provided in a senior high school to be erected at Mansfield, Ohio, at an estimated cost of $800,000. John H. Bristor is clerk of the board of education.

Deshler, Ohio, will take bids Aug. 26 for remodeling its water works and for new equipment, the cost of which is estimated at $40,000. George Champe, Nasby Building, Toledo, is the engineer.

Carrollton, Ohio, has completed plans for extensions to its water works department involving an estimated expenditure of $85,000. Equipment required will include six deep-well reciprocating pumps.

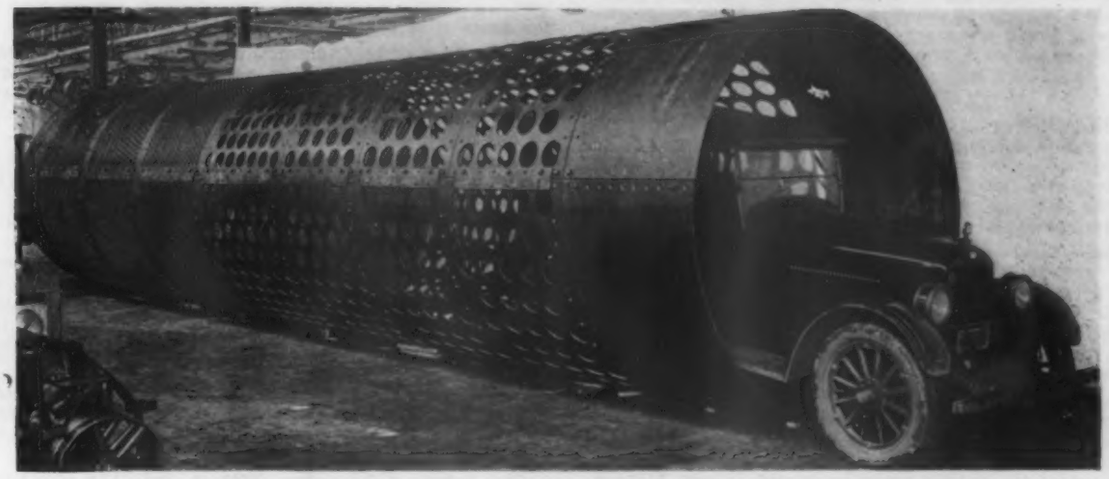
The Peerless Paper Box Co., Cleveland, has purchased the automobile plant of the Winton Co., which was recently acquired by real estate interests. The plant occupies 11 acres on which are nine buildings having an aggregate floor space of 375,000 sq. ft. The Peerless Paper Box Co. will occupy about half of the floor space.

Detroit

DETROIT, Aug. 19.

PLANS are said to be under consideration by the Ford Motor Co., Highland Park, Detroit, for the construction of a new assembling plant at Monterey, Mexico, consisting of a number of one-story units with power plant, to cost close to $1,000,000, with machinery.

The J. W. Murray Mfg. Co., 1975 Clay Avenue, Detroit, manufacturer of automobile parts, has completed plans for the construction of a two-story plant addition on Marston Street, near Fordyce Street, to cost about $30,000, with equipment



THE output of metal perforating shops ranges from fine and intricate designs to work of large dimensions, such as illustrated above, which is a cylinder 9 ft. in diameter and 27 ft. 10 in. long. Made for a stone quarrying company, the cylinder was constructed of ½-in. steel plate having several different sizes of perforation. Each section was made up of a number of plates fastened together at the joints with ½-in. straps riveted to one section and bolted to the next. The cylinder was assembled complete and afterward knocked down for shipment. The illustration does not show the framework, which was separate and made of heavy angles. The screen shown is one of four in a set used for broken stone and was manufactured by the Harrington & King Perforating Co., Chicago. Each screen has a capacity of approximately 2000 gross tons per hour, and when the plant is in full operation there are two shifts of 10 hr. each. During the screening operation the stone is also washed, and the material as it passes through the various size holes is carried by means of rubber conveying belts to different storage piles, according to the size of the product.

Kohner & Seeler, 405 Kresge Building, Detroit, architects, have plans under way for the construction of a four-story plant, 60 x 100 ft., at Erskin and Chene Streets, to be equipped for the manufacture of electric lighting fixtures; the owner's name is temporarily withheld. It will cost in excess of $60,000, with machinery. Bids will soon be asked.

The Michigan Central Railroad Co., Detroit, is said to have plans under advisement for the rebuilding of the portion of its ice-manufacturing and refrigerator plant at Springwells, Mich., used for Pullman car service, recently destroyed by fire with loss estimated at $150,000, including machinery.

The Packard Motor Car Co., Grand Boulevard and the Belt Line Railroad, Detroit, is having plans drawn by Albert Kahn, 1000 Marquette Building, architect, for a new service building at Woodward Avenue and Philadelphia Street, for which it is expected to ask bids at once.

The Detroit Edison Co., Detroit, will begin the erection of two new automatic power substations, each two-story, to be located on Forest Avenue, near Rohns Street, and on Willis Street, near Gibson Street, respectively, estimated to cost $45,000.

The Municipal Light and Power Department, Detroit, has awarded a contract to the H. G. Christman Co., Detroit, for substructure work for the proposed municipal electric generating station at a cost of $562,000. Other contracts for building and equipment are being let, and it is purposed to proceed with the project at an early date. It will have a capacity of 60,000 kw., and is estimated to cost $10,000,000, with transmission system.

The Greenan Bakeries, Inc., Detroit, has plans for the construction of a one-story automobile service, repair and garage building on Sixteenth Street, near Porter Street, for company motor trucks and cars, estimated to cost $35,000, with equipment. Foundations will be laid at once.

The Peerless Portland Cement Co., Detroit, has plans for the construction of a two-story power house for service at its works on West Jefferson Street, estimated to cost $25,000.

South Atlantic States

BALTIMORE, Aug. 19.

BIDS will soon be called by the Board of Estimates, office of the City Register, Baltimore, for the erection of a one-story machine and repair shop for the Fire Department, at the Key Highway and Webster Street, estimated to cost $100,000, with tools and equipment. Charles H. Osborne, building inspector, will be in charge.

Loading, conveying and other material-handling equipment, including factory trucks, power apparatus, etc., will be installed in the proposed eight-story equipment storage and distributing plant to be erected by Montgomery Ward & Co., operating a mail-order business at Monroe Street and Washington Boulevard, Baltimore, to be 340 x 400 ft., estimated to cost $2,000,000, with equipment. Theodore F. Merselles is president; W. H. McCaully is engineer, in charge of construction.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until Aug. 26, for one butt welding machine for use at the Puget Sound, Wash., navy yard, schedule 2525; also for one vertical tubular steam boiler at the Washington yard, schedule 2536; for a quantity of brass and copper pipe and tubing for various yards, schedule 2530; for one steam power ironing press for the Norfolk, Va., yard, schedule 2549; until Sept. 2 for battery charging switchboard and spare parts, for the Fore River, Mass., yard, schedule 2547; for 8000 ft. galvanized steel coil chain for the Mare Island, Cal., yard, schedule 2544; for 206 crucibles without covers for the Portsmouth, N. H., yard, schedule 2553; and for a quantity of sheet steel for various yards, schedule 2554.

The High Point Furniture Co., High Point, N. C., has inquiries out for a 150 hp. boiler and accessory equipment.

The Baltimore Copper Smelting & Rolling Co., Baltimore, a subsidiary of the American Smelting & Refining Co., 120 Broadway, New York, will proceed with the erection of its proposed one-story addition, to be equipped as a rod and wire mill, estimated to cost $250,000.

The City Council, Havre de Grace, Md., has called a special election on Aug. 30, to vote bonds for $700,000, the fund to be used for the construction of a municipal electric light and power plant, for which plans will be prepared at circular CAS-5.

The Chief of Air Service, United States Army, Washington, will take bids until Aug. 25 for 100 propeller retaining nut wrenches, and 100 propeller hub lock nut wrenches, wrenches, circular CAS-5.

The Tidewater Power Co., Wilmington, N. C., has acquired the municipal electric power plant at Whiteville, N. C., and plans for extensions and improvements in this section, with installation of additional equipment for service at Whiteville, Fair Bluff and Chadbourn.

The Carolina Machine Co., Fayetteville, N. C., is arranging for the early construction of a one-story foundry, to cost approximately $20,000, for which equipment is being purchased. C. G. Russell is president.

The Charles Warner Co., Wilmington, Del., manufacturer of building materials, operating sand and gravel properties, etc., has taken over the Penn Sand & Gravel Co., Tullytown, Pa., and will consolidate with its business. The plant of the acquired company has a present capacity of 2000 tons per day, and the new owner plans for the installation of digging, conveying and other mechanical equipment to develop an output of about 4500 tons of sand daily.

The Samuel Kirk & Sons Co., 106 East Baltimore Street, Baltimore, manufacturer of silverware and plated products, will take bids around the close of the month for the erection of its proposed one-story plant, 100 x 130 ft., at Taylor Avenue and Twenty-fifth Street, estimated to cost $85,000, with equipment. Richard C. Sandlass, 404 St. Paul Street, is architect. Henry C. Kirk, Jr., is president.

The Post Quartermaster, Marine Barracks, Parris Island, S. C., will take bids until Aug. 23 for a quantity of electrical equipment, including hand starting compensator, rubber covered wire, electric fittings, side cutting pliers, motor starting switches, two sets of twist drills, machine screws, hexagon nuts, etc.

Manual training equipment will be installed in the three-story and basement high school to be erected at Towson, Md., by the School Board of Baltimore County, Baltimore, estimated to cost $300,000, for which bids are being asked on a general contract. Smith & May, Calvert Building, Baltimore, are architects. C. L. Reeder, 906 North Charles Street, same city, is mechanical engineer.

The Ford Motor Co., Highland Park, Detroit, has awarded building contracts and will proceed with the erection of its proposed assembling plant at Norfolk, Va., consisting of a main shop, 300 x 800 ft., power house and auxiliary structures, with pier and oil house, estimated to cost $750,000, with machinery. The plant will be equipped for a capacity of about 7500 cars a month.

The Turrentine Automobile Co., Blackville, S. C., has plans for the construction of a one-story service, repair and garage building 45 x 180 ft., estimated to cost $35,000, with equipment.

The Southern Railway Co., Washington, is reported to be considering the construction of a one-story foundry at its locomotive repair shops at South Richmond, Va., and will make a number of improvements in the present works, with total estimated cost placed at $50,000.

L. P. Hunt & Co., Chase City, Va., are planning for the purchase of machinery for the manufacture of hoops for barrels and hogsheads, and kindred products.

St. Louis

ST. LOUIS, Aug. 19.

ARRANGEMENTS are being perfected by the Kansas City Bolt & Nut Co., Independent and Westchester Avenues, Kansas City, Mo., for a bond issue of about $1,250,000; a considerable portion of the proceeds to be used for plant extensions and betterments, including additional equipment. W. L. Allen is president.

Fire destroyed a portion of the plant of the Arkansas Foundry Co., Little Rock, Ark., with loss estimated at $30,000, including equipment. Rebuilding plans are under consideration.

The Mid-Continent Oil Leasing Co., Oklahoma City, Okla., will soon begin the construction of a new gas compressor and booster plant on site acquired near Duncan, Okla., with the installation of two 80-hp. compressor engines and auxiliary equipment. A pipe line will also be installed Contracts for equipment are being placed.

The Municipal Light Plant, St. Joseph, Mo., Charles D. Fox, superintendent, has tentative plans under consideration for extensions and improvements in the station, to include the installation of a Diesel oil engine unit and accessory apparatus. Arthur L. Mullergren, Gates Building, Kansas City, Mo., is consulting engineer.

The Board of Public Service, City Hall, St. Louis, plans for the installation of ice and refrigerating machinery in the proposed three-story and basement public market building, 195 x 270 ft., to be erected at Broadway, Lucas, Morgan and Sixth Streets, estimated to cost $1,000,000, for which a general contract has been let to the Fruin & Colnon Construction Co., Merchants Laclede Building. E. R. Kinsey is president of the board.

The Common Council, Bethany, Okla., plans the installation of centrifugal pumping equipment at its proposed municipal waterworks, estimated to cost $40,000 for which plans are being drawn by the McIntosh Co., First National Bank Building, Oklahoma City, Okla., engineer.

The Oklahoma Pipe Line Co., El Dorado, Ark., a subsidiary of the Standard Oil Co. of New Jersey, 26 Broadway, New York, will begin the construction of a new pipe line from the El Dorado fields to the company's refinery at Baton Rouge, La., with pumping stations, etc., to cost in excess of $400,000. The line will have a capacity of 20,000 barrels per day. Headquarters are at Ada, Okla.

The City Water Co., Sedalia, Mo., plans for the installation of centrifugal and other pumping machinery, and accessory mechanical equipment in connection with proposed extensions and improvements in its plants, estimated to cost $800,000.

The Common Council, Potosi, Mo., contemplates the installation of centrifugal pumping equipment in connection with a proposed municipal waterworks and sewage system, for which it is proposed to vote bonds for $50,000.

The Chamber of Commerce and J. W. Taylor, Deming, N. M., have plans under advisement for the installation of a hydroelectric project at Elephant Butte Dam, to serve the Mimbres Valley Irrigation District. The work will include the construction of high tension transmission lines.

Indiana

INDIANAPOLIS, Aug. 19.

CONTRACT has been let by the National Malleable & Steel Castings Co., 546 South Holmes Avenue, Indianapolis, to the Hall Construction Co., Board of Trade Building, for the erection of a one-story addition to be equipped primarily for annealing work, estimated to cost $100,000, with machinery.

The Indiana Electric Corporation, Indianapolis, has been granted permission to issue bonds for $510,000, and stock for $245,000, a considerable portion of the proceeds to be used for extensions and improvements in power plants.

The Board of Education, Elkhart, Ind., has completed plans and will begin the construction of a new power house at the central high school, to cost in excess of $75,000. An addition will also be built to the high school, with installation of manual training equipment.

Pohlmeyer & Pohlmeyer, Central Building, Fort Wayne, Ind., architects, have completed plans for a one-story and basement automobile service, repair and garage building, 50 x 150 ft., on local site, to cost approximately $38,000, with equipment.

The Common Council, New Harmony, Ind., is considering the installation of centrifugal pumping equipment in connection with a new waterworks, for which preliminary surveys are now in progress. The National Co., 626 J. M. S. Building, South Bend, Ind., is engineer.

The Board of Education, Frankfort, Ind., plans for the installation of manual training equipment at its proposed high and grade school, estimated to cost $100,000, for which bids will soon be called on a general contract. Rodney Leonard, Frankfort, is architect.

The Board of School Trustees, Glenn, Ind., with Elmer H. Dickerson, Terre Haute, Ind., Rural Route E, in charge, will soon take bids for the construction of a power house for local school service. Plans have been drawn by the Shourds-Stoner Co., Tribune Building, Terre Haute, architects.

The Indiana Gas & Electric Co., Evansville, Ind., has applied for permission to issue preferred stock for $500,000, a portion of the fund to be used for extensions and betterments in power plants.

The Circle Garage, Indianapolis, has construction in progress on a new service, repair and garage building, estimated to cost $350,000, including equipment. It is expected to have the structure ready for occupancy at an early date.

Milwaukee

MILWAUKEE, Aug. 18.

PROSPECTIVE requirements of the new Ajax Motors Co. of Racine, Wis., for retooling the former Mitchell automobile works, remain the most interesting spot in the machine-tool situation. Nothing has been said so far concerning the definite specifications, although it is estimated that at least a part of the large list of needs will be issued early in September. Otherwise business in the machine-tool trade follows a listless course. Inquiry is moderately active, but embraces relatively light requirements, mostly single items scattered among a wide variety of customers and classes of business. The City of Milwaukee closed bids Aug. 12 on a 16-in. and a 30-in. lathe for the Riverside pumping station. Eight concerns entered bids, but a decision will not be made for at least a week.

The Henry A. Poppert & Son Co., 421 Third Street, Milwaukee, brass and aluminum founder, machinist, and manufacturer of steam pressure cookers, has purchased the real estate and buildings of the former Bull Dog Tractor Co. at Fond du Lac, Wis., from the creditors, and will retool the plant immediately. The principal product will be cookers and an initial output of 125 a day is planned. An affiliated firm, H. A. Poppert & Son, manufacturers of wood and metal patterns, will remain in the present Milwaukee

plant until a proposed wing addition to the Fond du Lac works is built. Henry A. Poppert is president and general manager.

The Evenflo Deep Well Pump Co., of Minneapolis, Minn., is seeking a location for its permanent works and T. R. Minert, sales manager, has visited Waukesha, Wis., to confer with Casper Reichelt, president Spring City Foundry Co. The Waukesha Association of Commerce also has interested itself in the matter and definite results of negotiations are expected shortly.

The Bonduel, Wis., Village Board, William Baumeister, secretary, is receiving bids for a 500 gal. per min. centrifugal pumping unit for the new system of fire protection.

C. H. Edwards, Spooner, Wis., has engaged Johnson & Griswold, architects, Superior, Wis., to design and erect a $25,000 garage and repairshop, 60 x 150 ft., part two stories.

The Brillion Iron Works, Brillion, Wis., is contemplating a series of works extensions, to be made from time to time during the coming year. The capital stock has been increased from $100,000 to $175,000 to finance the enlargement program, which will involve the purchase of considerable equipment.

E. G. Krueger, Bonduel, Wis., has plans by Herman Wildhagen, architect, Appleton, Wis., for a $35,000 public garage, sales and service building, 76 x 117 ft., to replace the garage destroyed by fire several weeks ago. Work will begin at once. Equipment is being purchased.

The Rural Normal School Board of Sheboygan County, Wis., is ready for bids for the manual training and domestic science equipment, gymnasium requirements, etc., for the new Sheboygan County Training School, O. F. Huhn, 802 Center Avenue, Sheboygan, is chairman.

Gulf States

BIRMINGHAM, Aug. 19.

THE plant and property of the Clarksville Light Co., Clarksville, Tex., have been acquired by new interests, headed by C. E. Calder and John W. Carpenter, Dallas, Tex., the first noted to be president of the company. Plans are under consideration for extensions and improvements, including the installation of additional equipment.

Foundry interests at Anniston, Ala., have formed a new organization, to be known as the Gulf States Pipe Corporation, with initial purpose to handle the output of the affiliated interests, and later to develop in the line of manufacture of cast iron soil pipe, fittings and other cast iron products. The local foundries joining in the enterprise are the Independent Soil Pipe Co., Emory Foundry Co., Interstate Foundry Co., and the Rudisell Soil Pipe Co. The new organization will also have working agreements with the Kilby Pipe Co., and the Southern Pipe & Foundry Co., both of Birmingham, Ala.; and the Southern Pipe & Foundry Co. of Knoxville, Tenn. Offices will be in the Smith Building, Anniston. Whitfield Clark is president.

The Alabama Power Co., Birmingham, Ala., is negotiating for the purchase of the electric light and power plant of C. T. Davidson, Helena, Ala., and is also arranging for the acquisition of the power plant of the Demopolis Light & Power Co., Demopolis, Ala. Plans are under way for extensions and improvements in the districts noted, with the installation of additional equipment and transmission lines.

The City Commission, Putnam, Tex., plans for the installation of centrifugal pumping equipment in connection with proposed extensions and improvements in the municipal waterworks, for which a bond issue of $35,000 will soon be arranged.

The Common Council, Brookhaven, Miss., is arranging a bond issue for $300,000 recently approved by a vote of citizens, a portion of the proceeds to be used for extensions and improvements in the municipal electric power plant, including the installation of coal and ash-handling machinery and other equipment. Plans will be drawn at an early date.

The State Docks Commission, Mobile, Ala., plans for the installation of electric traveling cranes, hoisting, conveying and other material-handling equipment at the proposed new local docks, for which a fund of $10,000,000, is available. The initial work will cost $1,000,000. Eight slips, each 1600 ft. long will be constructed for docking, each to accommodate six vessels.

The W. A. Browning Machinery Co., 3025 Elm Street, Dallas, Tex., has work in progress on its new building at Exposition and Commerce Streets, estimated to cost $25,000, and proposes to have the structure ready for the equipment installation at an early date.

The Common Council, Crawford, Tex., has plans under way for the construction of a new pumping plant and the installation of machinery at the municipal waterworks. A fund of $25,000, is being arranged for the expansion.

The West Texas Utilities Co., Abilene, Tex., is having plans drawn for the construction of a one-story machine shop at Coleman, Tex., estimated to cost $45,000, with equipment. Adams & Adams, Gibbs Building, San Antonio, Tex., are architects. Earl Hoppe, Abilene, is superintendent.

F. P. Joseph, Glenmore, La., consulting engineer, is preparing plans for a municipal light and power plant for Cheneyville, La., to cost about $40,000, with machinery and equipment.

Pacific Coast

SAN FRANCISCO, Aug. 13.

PRELIMINARY plans are being considered by the California Wire Co., 204 North Cypress Avenue, Orange, manufacturer of insulated wire and cable, for a new plant in the vicinity of Pittsburg, Cal., estimated to cost $1,000,000 with machinery. Louis Koth is president and Fred A. Grote, secretary and treasurer.

The Phoenix Furniture Co., Twenty-ninth and Naomi Streets, Los Angeles, has tentative plans for rebuilding the portion of its plant destroyed by fire Aug. 1, with loss estimated at $100,000 including equipment.

The Southern California Specialty Glass Mfg. Co., Long Beach, Cal., has acquired property in the Signal Hill section for a new plant. The initial unit will cost $400,000 and will be supplemented with other units later. H. A. Schnelbach is president, and H. R. Fay, secretary and treasurer. The last noted is also secretary of the local Chamber of Commerce.

The Mack International Motor Truck Corporation, Los Angeles, has plans for a two-story service and repair work, 250 x 300 ft., and one-story storage building, 135 x 900 ft., estimated to cost $350,000, with equipment. John M. Cooper, Marsh-Strong Building, is architect.

The Puget Sound Power & Light Corporation, Seattle, operated by the Stone & Webster Management Corporation, 147 Milk Street, Boston, is completing plans for a hydroelectric generating station on the Baker River, to develop a capacity of 60,000 hp., estimated to cost $7,500,000, with power dam and transmission system. The company is also planning the erection of an addition to its steam-operating electric power station in the vicinity of Tacoma, Wash., to cost $500,000 with machinery.

The Vitrified Products Corporation, Jefferson Street, North San Diego, Cal., has begun extensions and improvements at its plant to double approximately the present capacity. Additional machinery will be installed. The estimated cost is $100,000 including equipment.

The Municipal Light and Power Bureau, Pasadena, Cal., has filed plans for a one-story power substation at 1415 North Raymond Avenue.

The West Virginia Lamp Co., care of the Chamber of Commerce, Anaheim, Cal., has completed negotiations for local property, totaling about one acre, and will have plans drawn at an early date for the erection of a new plant for the manufacture of electric lamps.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, will soon ask bids on a general contract for its proposed mechanical works at Emeryville, Cal., consisting of machine shop, foundry, electrical shops, metalworking shops, warehouse and storage yards, estimated to cost $500,000, with equipment. The engineering department of the company is in charge.

The Coast Valleys Gas & Electric Co., Salina, Cal., is arranging for a preferred stock issue of $2,500,000, a portion of the proceeds to be used for extensions and improvements in power plants and system.

The Board of County Supervisors, Sacramento, Cal., will build a power house in connection with its proposed mechanical laundry plant at the county hospital grounds, estimated to cost $95,000.

The Peoples Fuel Co., Cornwall and Chestnut Streets, Bellingham, Wash., has plans for the erection of a new carbonizing plant on the Guide Meridian Road, estimated to cost $75,000, with equipment. F. E. Hobson is general manager.

The Alloy Steel & Metals Co., 1900 East Fifty-fifth Street, Los Angeles, has filed plans for the erection of a one story addition to its plant, for which foundations will be laid at once.

The Monarch Forge & Machine Works, Portland, Ore., has plans under construction for the erection of a one-story machine shop on Blackstone Street, near York Street.

The Universal Auto Signal, Inc., 515 Broadway Arcade Building, Los Angeles, Cal., organized with $250,000 capital stock, will manufacture signal devices for the automotive trade. Bids will be opened at once for the various parts. No awards have been made yet and no plant will be maintained by the company. C. G. Hoover is president.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates

	Per Lb.
Bars:	
Refined iron bars, base price	3.24c.
Swedish charcoal iron bars, base	6.75c. to 7.25c.
Soft steel bars, base price	3.24c.
Hoops, base price	4.49c.
Bands, base price	3.99c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.34c.
Channels, angles and tees under 3 in. x ¼ in., base	3.24c.
Steel plates, ¼ in. and heavier	3.34c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.25c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.50c.
Toe-calk, ½ x ⅜ in. and larger	4.20c.
Cold-rolled strip, soft and quarter hard	7.00c.
Open-hearth spring steel	4.50c. to 7.00c.
Shafting and Screw Stock:	
Rounds	4.15c.
Square, flats and hex	4.65c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High-speed steel, 18 per cent tungsten	70c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.89c.
No. 12	3.94c.
No. 14	3.99c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.30c. to 4.45c.	.....
Nos. 22 and 24	4.45c. to 4.60c.	5.10c.
No. 26	4.50c. to 4.65c.	5.15c.
No. 28*	4.60c. to 4.75c.	5.25c.
No. 30	4.70c. to 4.95c.	.....

Galvanized

	Per Lb.
No. 14	4.70c. to 4.85c.
No. 16	4.85c. to 5.00c.
Nos. 18 and 20	5.00c. to 5.15c.
Nos. 22 and 24	5.15c. to 5.30c.
No. 26	5.30c. to 5.45c.
No. 28*	5.60c. to 5.75c.
No. 30	6.10c. to 6.25c.

*No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	—41	—24	½ in. Butt...	— 4	+19
¾ in. Butt...	—46	—32	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in Lap.	—44	—30	2 in. Lap....	— 5	+14
7-8 in. Lap...	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap..	—34	— 6	7-12 in. Lap..	— 3	+16

Bolts and Screws

Machine bolts, cut thread,
50 to 60 and 10 per cent off list
Carriage bolts, cut thread,
40 to 40, 10 and 10 per cent off list
Coach screws, 50 and 10 to 65 per cent off list
Wood screws, flat head iron,
75, 20 and 10 per cent off list

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per Lb.
Bright, basic	4.25c. to 4.50c.
Annealed soft	4.50c. to 4.75c.
Galvanized annealed	5.15c. to 5.40c.
Coppered basic	5.15c. to 5.40c.
Tinned soft Bessemer	6.15c. to 6.40c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17 c. to 18½c.
High brass wire	17½c. to 18½c.
Brass rods	14¾c. to 15¾c.
Brass tube, brazed	25 c. to 26 c.
Brass tube, seamless	21½c. to 22½c.
Copper tube, seamless	22¾c. to 23¾c.

Copper Sheets

Sheet copper, hot rolled, 20⅜c. to 20⅞c. per lb. base.
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20
IC	$11.25	$8.85
IX	12.85	10.85
IXX	14.40	12.55
IXXX	15.75	13.85
IXXXX	17.00	15.05

Coke—14 x 20	Prime	Seconds
80 lb.	$6.15	$5.90
90 lb.	6.30	6.05
100 lb.	6.45	6.20
IC	6.65	6.40
IX	7.85	7.60
IXX	9.00	8.75
IXXX	10.35	10.10
IXXXX	11.35	11.10

Terne Plates

8 lb. coating, 14 x 20

100 lb	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits, pig	56c.
Bar	60c. to 65c.

Copper

Lake ingot	16 c.
Electrolytic	15½c.
Casting	14½c.

Spelter and Sheet Zinc

Western Spelter	7½c.
Sheet zinc, No. 9 base, casks	10½c. open 11¼c.

Lead and Solder*

American pig lead	9¼c. to 9¾c.
Bar lead	11c. to 12c.
Solder, ½ and ½ guaranteed	38 c.
No. 1 solder	35 c.
Refined solder	29½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	11½c. to 12c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	36c.

Old Metals

The market continues strong and trading is active. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible	11.50
Copper, heavy wire	11.00
Copper, light bottoms	9.50
Brass, heavy	6.50
Brass, light	5.50
Heavy machine composition	8.50
No. 1 yellow brass turnings	7.00
No. 1 red brass or composition turnings	7.75
Lead, heavy	6.75
Lead, tea	5.25
Zinc	3.50
Cast aluminum	15.00
Sheet aluminum	15.00